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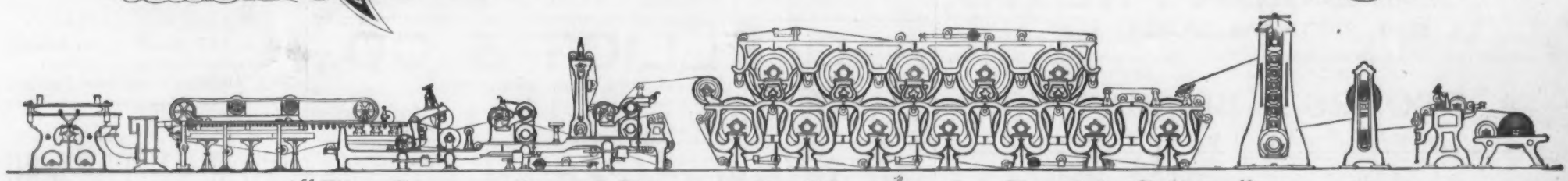


"The Consumption of Paper is the Measure of a People's Culture."

VOLUME XXIV.—NO. 19. NEW YORK, MAY 11, 1895. WHOLE NUMBER 1097.

Trade Topics.

Brick Digester Lining.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY CHARLES FERRY.

For the past few years sulphite fibre manufacturers have been devoting much of their thought and experimental skill toward perfecting an efficient sulphite digester lining. The old forms of lead lining, either burned or blocked fast to the shell, and with which the hot liquor came directly in contact, have been pretty generally abandoned as unsatisfactory, inadequate and impracticable. Most manufacturers who have once used them have suffered the great inconvenience of a rapid succession of digesters "laid off" for repairs when least expected, and especially at times when urgent orders have demanded all of the available capacity of the mill for the production of the requisite amount of stock. They will never forget the Sunday work which was devoted exclusively to lead burning, and also the fact that it required all of the seventh day of each week to restore the digesters to their proper condition for another week's run. Then it was not unusual for a digester to spring such a tremendous leak during the week as, when steaming up to pressure, to throw a stream of hot liquor almost the entire width of the digester room.

It is well known to all who are familiar with this subject, no doubt, that the unequal expansion and contraction of the lead and steel, due to the effect of heat and cold, distorts and finally breaks the lead where it is attached to the shell. While under these circumstances it cannot be said that the chemical action of the hot acid does not assist these physical forces in the destruction of the lead, it must be admitted that the chief source of the difficulty is in the heat imparted to the shell and lead by the liquor. The patented digester linings which have adopted the use of acid proof brick on top of the lead and the shell have solved a great problem.

Digester bricks not only resist the chemical action of the sulphite liquor, but they protect the lead and shell from any great changes of temperature due to the heat conducted from the acid. Their heat conductivity is very low, and they possess also a great capacity for absorbing and retaining heat. If by any chance a few drops of liquor pass through the brick lining, a lead lining beneath it protects the shell from any possibility of its strength being impaired by chemical decomposition. These digester linings are found to be extremely efficient, both theoretically and practically—so much so that even now we are unable to say how long the best of them can be made to last. With such an interior lining of acid proof brick the shell and the thin lead lining just next to it should always remain at about the temperature of the outside air, and at the same time be thoroughly protected from any chemical or physical changes arising from the hot acid.

Brick manufactured for lining digesters should contain a very high percentage of anhydrous silica (SiO_2). The protoxide or sesquioxide of iron ought never to be present, for fear of the pulp being stained with iron salts. Other soluble and easily decomposible bases reduce the acid proof property of the brick. The bricks should not be made absolutely non-porous throughout, for the reason that by reducing their porosity beyond a certain limit the heat conductivity is very materially increased; therefore it is not advantageous to adopt for use a digester brick which is absolutely non-porous. This is not a feature, in connection with acid proof brick, which is only purely theoretical and of little practical significance. From physical tests it has been practically demonstrated that fire brick, manufactured from material which will yield a burned product strikingly similar to the vitrified paving brick, are much better conductors of heat than others more porous and open. It is essential then not to choose the brick which resembles the closest a perfectly vitrified mass, if it is desired to produce the best results in the direction of protecting the lead from extreme and sudden changes of temperature.

The very slight porosity necessary for giving the digester brick that well-known property for absorbing and retaining heat must be effected in the process of manufacture with care and discretion. The component parts of an acid proof brick should be very thoroughly combined, and in such a manner that the bond cannot be destroyed by contact with hot sulphite liquor. This can be accomplished by using only strictly acid proof constituents. As I said before, bases which suffer decomposition in hot acids or their corresponding silicates should not exist in the brick in more than very sparing quantities.

If acid proof bricks are well made, and from the proper combination of the purest material, they are practically indestructible, except as a result of an abrasive action, due to rough handling in removing them from the lining. After one or two cooks the pores of the brick begin to be filled with a hard deposit of the sulphite of lime. The white precipitation which takes place when the hot liquor loses some of its free volatile sulphurous acid is well known to all who are familiar with the chemistry of the bisulphite of lime. The physical character of this deposit, especially with reference to hardness and its apparent insoluble nature, are facts which sometimes have puzzled and annoyed practical mill men.

In one respect this tendency of the liquor to soak into the bricks of the lining as the cooks proceed, and to fill their interstices with an exceedingly hard crystalline mass, consisting of sulphite of lime, with possibly a little sulphate of lime, works favorably in so far as it renders the brick more impenetrable to the liquor, but this gradually obliterates its slight porosity, by virtue of which the brick is better able to keep the heat of the liquor away from the lead.

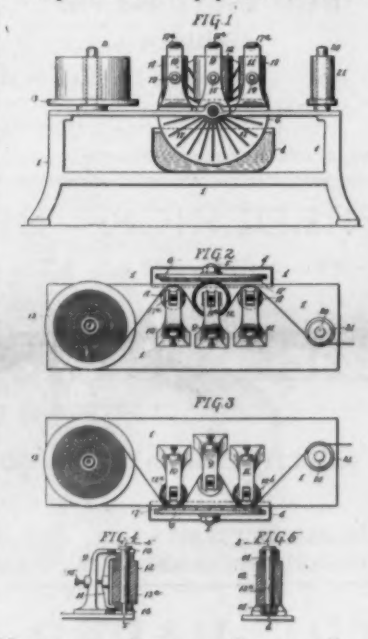
It is easy to illustrate the precipitation which occurs when cold sulphite liquor of the ordinary strength is relieved of most of its free sulphurous acid. Boil a small volume of the liquor in a glass vessel. The liquor is highly charged with free sulphurous acid, and even at the temperature of the outside air it will yield copiously that gas whose odor is unmistakably characteristic; but when the solution is boiled, most of the free sulphurous acid gas is evolved; then the normal sulphite of lime is thrown down as a white, finely divided crystalline precipitate. In other words, the normal sulphite of lime is only soluble in water saturated with sulphurous acid gas.

To return again to the subject, digester brick should be made curved to conform to the surface of the shell, and, moreover, so tapered for the top and bottom that each brick will go into place without chipping. Usually they are very tough and hard, and can only be cut with the greatest difficulty. The joints between the brick ought to be close and well formed. This cannot be accomplished with any degree of satisfaction unless the bricks are made especially to meet the requirements of the particular digester in question. Acid proof bricks have acted thus as a complement of the old lead lined shell in the development of a digester lining adequately capable, both physically and chemically, of manufacturing sulphite pulp at minimum cost and with the least expenditure for repairs.

Looking back over the records we discover that with the advent of the brick lining for the upright digesters has come not only a radically favorable reduction in the expense of keeping this department in condition for work, but almost a double production. Now a boiler can be filled, cooked and dumped in fifteen to sixteen hours, as against twenty-five hours, which represents a fair average of the time required for completing the same work in a digester lined with sheet lead alone. The brick lined digester practically utilizes every unit of heat which passes into it, for there is no loss by radiation. After the contents of a boiler are cooked and dumped the heat retained by the brick is sufficient to warm the next charge of acid and chips and bring it up to pressure again with much more rapidity. For ten years sulphite manufacturers have been wishing for the day when digesters might be run as continuously and with as little annoyance as the remainder of their mills, and now it can be truly stated by many of them who have fairly grown bald and gray in their pursuit—features which have not wholly come with age—that their prayers have been fully answered.

Machine for Spreading Paste, Etc., on Strips of Paper.

An illustration is given of an apparatus for supplying paste or coloring matter to strips or bands of paper, &c., one of the



MACHINE FOR SPREADING PASTE ON STRIPS OF PAPER.

principal objects of the invention being to utilize the pulling strain produced by the feed of the strip or band for the purpose of operating the paste-distributing devices, so that all auxiliary operating mechanism may be dispensed with.

Figure 1 is a sectional elevation on the line 1—1 of Fig. 2 of the machine constructed in accordance with this invention; Fig. 2 is a plan view of the same; Fig. 3 is a plan view illustrating a modified construction; Fig. 4 is a sectional view of a detail on the line 4—4, Fig. 5, and Fig. 5 is a sectional elevation on the line 5—5, Fig. 4.

1 represents a suitable supporting framework, or table, on which is mounted a spindle or support, 8, for the reception of a drum, 13, on which the strip or band to be supplied with paste or color is wound.

Extending transversely across the table or secured thereto in any suitable manner is a stub shaft, 5, on which is mounted a disk, 6, provided on one of its faces with a series of radially arranged ribs, 17, the disk being of such size and so mounted as to extend below the surface of the table and travel partly within a reservoir, 4, arranged immediately below the disk and adapted to contain a supply of paste or coloring matter or other substance.

On the upper surface of the table are secured three bracket arms, 9, 10 and 11, the central bracket 9 being adapted to support a supply roller, 12, mounted on a spindle, 13^a, the opposite ends of which are secured in the opposite arms of a yoke, 14, which may be adjusted toward and from the supply disk by a screw, 15, and in order to admit of this adjustment the upper and lower portions of the bracket arm are slotted at 16, 16, for the reception of blocks projecting from the yoke 14, or, as shown in the drawings, the spindle upon which the roller is mounted may extend through the bracket, the bearing arms of the yoke and the intervening roller, so that when occasion requires the spindle may be readily removed and the roller examined or repaired. The peripheral surface of this roller, 12, is provided with a facing of yielding or absorbent material, and if necessary may be provided with a series of longitudinal ribs or grooves to engage with and turn the disk 6, and the roller may by adjusting the screw 15 be forced into more or less intimate contact with the disk, so as to effectively rotate the latter.

The brackets 10 and 11 are similar in construction to bracket 9, each being provided with a suitable spindle, 17^a, on which is mounted a guiding roller, 18, adjustable laterally by means of screws 19, so that the relative positions of these rollers may be adjusted to cause a strip or band fed from the supply drum to be brought into contact with a greater or less portion of the periphery of the roller 12.

At the opposite end of the table is a spindle, 20, on which is mounted a guide roller, 21, and the strip or band after feeding from the drum passes first over the guide roller 18, thence partially around the supply roller, and thence over the guide rollers 18 and 21 to the point where it is to be used. By this means the paste within the reservoir is at all times kept in an agitated condition, the heavier portions being prevented from settling to the bottom, and as the disk 6 rotates the radially arranged ribs become coated with paste, but before reaching the roller 12 any access of paste will fall from the ribs by gravity into the reservoir, and the absorbent surface of the roller will receive an even and regular supply of paste, which will be distributed upon the surface of the strip or band.

Fig. 3 illustrates a slightly modified construction of the machine, the paste being distributed upon the paper from the ribs of the supply disk, and by preference two rollers, 12^a and 12^b, having peripheral coverings of yielding material, are utilized to guide the strip or band into position where it may be acted upon by the ribs, the pulling strain in this case also serving as the means for rotating the supply disk.

The apparatus may be used for supplying coloring or other matter to strips in place of the paste or adhesive material, and the parts of the apparatus may, if necessary, be duplicated so as to supply both of the sides of the strip with coloring matter or with paste or other material.

Important Decisions on Insurance Policies.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

In these days many insure against accident, more insure their lives, and almost everyone insures his property. Every merchant is interested in the subject, and therefore some of the more important points covered by decisions of the highest courts of the country during the past few months are given below. A few of them seem so self-evident that one wonders at a contest; but the fact of their recent submission on appeal proves that even the simple principles of law cannot be too often repeated. The citations are from the standard reports, and full statements of them are to be found in almost any well-equipped law office.

False statements that no other applications have been made for insurance avoid a policy (32 N. Y. S. Rep., 223).

A policy issued by an agent of an insurance company to a corporation of which he is a stockholder and officer is void (17 So. Rep., 83).

Notice to a general agent of an insurance company that the insured is using an engine on the premises is notice to the company (31 Atlantic Rep., 317).

An agent employed to manage a store, and who carries on the business in his own name, may insure the property in his own name (30 Atlantic Rep., 450).

A clause in a policy providing that the company shall not be liable for losses occurring while any part of the premium is overdue and unpaid is valid (38 N. E. Rep., 417).

Knowledge of the agent who obtained the insurance that the insured was a lessee of the property is binding as to renewals obtained through such agent (17 So. Rep., 13).

A policy of insurance forbidding the use of gasoline on the premises is avoided by a violation of the condition by one occupying them by the consent of the insured (39 Pac. Rep., 697).

Where arbitrators appointed to determine the loss fail to agree, and the parties cannot agree upon other arbitrators, the insured may sue on the policy at once (21 S. E. Rep., 302).

A foreign company insuring property without complying with the requirements of the statutes cannot collect premiums of a policy holder, although the insurance was contracted outside of the State (62 N. W. Rep., 526).

By delivering a policy of insurance, knowing the existence of other insurance on the premises, the company waives a condition that other insurance would render the policy void (60 N. W. Rep., 345).

An oral agreement between the owner of property and the agent of the company in regard to the renewal of a policy, in which the amount of insurance is not fixed, does not constitute a binding contract (61 N. W. Rep., 209).

If an insurance company denies its liability on independent grounds, before any proofs of loss are made, and before the expiration of the time within which such proofs are by the terms of the policy to be made, such denial constitutes a waiver of the condition requiring such proofs (20 S. E. Rep., 691).

A condition in a policy making it void in case of a change in the ownership of the property is violated by such owner taking another into partnership (39 N. E. Rep., 99), and the clause in an insurance policy by which the company covenants to pay "the insured, his executors, administrators and assigns" any loss, does not extend the insurance to a new partner's interest (39 N. E. Rep., 77); but a transfer of insured property between partners is not a breach of the condition against transfer (39 Pacific Rep., 587).

The clause in an insurance policy that "no officer, agent or other representative of the company" shall have power to waive any condition or provision in it, is a valid agreement when assented to by the insured, and limits the powers of local, special and adjusting agents (60 N. W. Rep., 663); but when an insurance company appoints an agent and sends him a commission to solicit applications the public is warranted, in the absence of any notice of limitations on his authority, in assuming that he is clothed with power to receive and act on applications, and bind the company (63 Federal Rep., 382).

An insurance company which received the premium, and allowed a policy to remain in force for months and until after a loss of the property, cannot cancel the policy because of an incorrect statement in the application in regard to incumbrances, which was made inadvertently, and the truth was known to the agent who issued the policy (61 N. W. Rep., 582); but an insurance broker who writes an application for the insured and who is not known to the company is the agent of the insured, so that misrepresentations in the application, due to his error, which are made warranties, avoid the policy (16 So. Rep., 798).

Where a policy of insurance is open and not valued over-valuation by the insured is immaterial in the absence of actual fraud, and does not avoid the policy (29 S. W. Rep., 678). Where statements as to the value are made warranties, placing an unreasonable value on the property renders it void, and where the application is made a part of the contract the statements contained in the application are warranties (39 Pac. Rep., 587), but it has also been held that warranties incorporated in a policy by reference to the application do not avoid it (39 N. E. Rep., 771).

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[FROM OUR REGULAR CORRESPONDENT.]

PHILADELPHIA, Pa., May 8, 1895.

Senator Penrose's "Lexow" resolution, baseball and the sale of Alexander Balfour & Sons' paper mills are the principal topics of interest among the paper trade, as well as among business men generally at present.

The much talked of Penrose resolution has passed the State Legislature at Harrisburg. This is a measure to "Lexow" our city government. For some years we have been governed under the Bullitt bill, which is a measure primarily intended to bring the responsibility of the management of city affairs into smaller compass than before. For some time there has been a general feeling among business men that it is time to call a halt and look into the workings of this bill. It was such a radical change from former methods that it has been thought wise to take a balance sheet of it, so to speak. The investigation was proposed by business men, but it met bitter opposition from the political element. However, I see that it has passed, and now everybody will be watching the daily papers in the human-nature-like hope of seeing developments which may put some prominent people "in a hole."

The biggest deal made in the mercantile world since John Wanamaker's memorable purchase of the stocks of Riegel, Scott & Co. and Hood, Foulkrod & Co. was consummated on Friday last, when the extensive paper and pulp works of Alex. Balfour & Sons at Port Richmond were purchased by Dill & Collins, formerly connected with C. S. Garrett & Sons, paper manufacturers, of Darby. The consideration was, in round numbers, $500,000, and does not include any stock on hand, of which the Messrs. Balfour have about 5,000,000 pounds.

The news of the change spread quickly among the members of the trade, who were at first disposed to regard the sale as a rumor. Robert A. Balfour, manager of the establishment, verified the report, and stated the firm would be succeeded by Dill & Collins on June 1.

The paper mill in question is the largest plant in Pennsylvania, covering 10 acres of ground and employing 350 persons, and manufacturing all grades of paper but news. It is located opposite the Twenty-fifth Ward Gas Works.

Alexander Balfour, the senior member of the firm, is a very successful business man, having risen from a humble position to his present high place in the mercantile world. Three years ago his sons, Robert A. and James G. Balfour, were admitted to the firm, and the name was changed from Alex. Balfour to Alex. Balfour & Sons.

C. S. Garrett, Sons & Co. state that Mr. Collins is no longer in their employ, but that Mr. Dill will remain with them until June 1.

William L. Lance died on Thursday, the 24 inst., at his residence in Germantown. He was seventy-eight years old. About 1860 he leased from the Berwick authorities in the Wyoming Valley a certain water power and began to experiment in making paper from the pulp of basswood. Many well-known paper firms declared that he was crazy, but he continued the work and finally succeeded in making paper in a crude form. After spending considerable money he sold the plant to others, who have since perfected the process of making wood paper. Mr. Lance was a man of great ability and energy, and was identified with many other business enterprises in the course of his long life. The writer was acquainted with him at the time when he was in the midst of reverses and could not help admiring his unquenchable hope and vim. He leaves seven sons.

The following named paper manufacturers and dealers have agreed to close their respective places of business from May 1 to October 1 at 1 o'clock, P. M., on Saturdays, and other days at 5 P. M.: A. G. Elliot & Co., the Jessup & Moore Paper Company, Charles M. Stoever & Co., Albert DeCernea & Co., Whiting Paper Company, Irwin N. Megargee & Co., Nevius & Sentman, Philip Rudolph & Sons, Molten & Munch, Megargee & Green Company, the Thomas W. Price Company, S. M. Kennedy & Co., Scott Paper Company, Simmons & McKain, Garrett & Buchanan, Buchanan & Collins, Nescochague Manufacturing Company.

Philadelphia is a good baseball town. Twenty-three thousand people saw those "Giants" from New York mop up the ground with our Quaker boys in the opening game last week, and 500 more who paid to get in and could not get even a glimpse of the players got their money back at the gate. Our mayor tossed the first ball and the names of senators, clergymen, judges "and sich" made a string over a column long in the papers the next day. I met Joe Mitchell and a number of other paper men on the way to the game.

The paper trade take a great interest in baseball, and a number of nines are being formed, among which may be mentioned Wolf Brothers, Jessup & Moore, C. M. Stoever & Co. and the Nescochague Manufacturing Company. C. M. Stoever & Co.'s nine are scheduled to play the Glen Mills club next Saturday. Charley Kane is the manager of the Stoever nine and the battery will be George Husted and Billy Greiner. The latter is said to be a "hypnotic" pitcher, while George is well known to be a stone wall behind the bat; if there is no stone wall handy he gets behind the nearest fence.

C. S. Garrett, Sons & Co. are doing a good business in building and roofing papers, but in their principal line—hanging papers—they are very dull, owing to the fact that this is the dull season for that trade. The paper hanger printers are now getting out their samples for next season.

Our cheerful friend Senator Kennedy is down in Maryland, at Beckleysville, superintending the getting under way of the Star Mills there, which he has purchased. They will be started in a few days on book paper.

De Cernea & Co. say that they are quite busy; that they consider the business situation in better shape than for some time; that there is less haggling among buyers, and that prices show a tendency toward stiffening. I find these views confirmed by a number of other paper men, and am forced to the cheerful conclusion that there are really better times ahead for us.

Recent visitors in the trade were: Messrs. Campbell, of Eaton, May & Robbins Company; Haywood, Linden Paper Company; Spencer, Valley Paper Company; Bechtel, Bally, Pa.; Judd, Waukegan Paper Company; W. A. Mullin, Mount Holly Springs, Pa.; Chapin, Ticonderoga Paper Company; D. M. Bare, Roaring Spring Paper Company; Busch, Old Berkshire Mills; Coye, C. H. Dexter & Sons; Chas. E. Callender, Glendale, Mass.; J. Symington, J. Symington & Co., and Chas. Chapin, of Springfield, Mass.

The paper stock market remains about the same. Quotations are as follows: Philadelphia whites, 2⅞@3c.; No. 2 Philadelphia whites, 2@2½c.; blues and thirds, 1½c.; colors, free blacks, ⅞c.; blacks, ⅝c.; No. 1 white shavings, hard, 2¼c.; No. 1 white shavings, soft, 1¾@1⅞c.; No. 2 white shavings, ⅞@1c.; mixed shavings, ¾@⅞c.; book stock, ⅞@1c.; news, 45@50c.; manillas, ⅞@1c.; ledger paper, 2@2⅛c.

There is little to note in the chemical market. Spot Bleach is in good demand for limited quantities at 1⅞@2c. per pound; 48 per cent. caustic soda ash is held at 1⅜c.; 58 per cent. alkali at 90c. for 48 per cent.

FOUNTAIN PEN.

HOLYOKE.

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., May 9, 1895.

This has been a very quiet week with the manufacturers and nothing of importance has transpired.

The movement of paper has not increased materially in volume. The season of quiet trade is very nearly upon us, and for the next few weeks orders will not be very numerous. This state of affairs is to be expected during the warm weather.

The demand for fine writings is somewhat limited, and the call for book papers is not brisk by any means. The coarser grades are moving fairly well.

As to the stock market, very little change is manifested. There is a medium demand for domestic rags of good quality, but foreign stock is moving very slowly. Prices do not show any change.

The work of building the new engine room for the George C. Gill Paper Company is being pushed, and the addition will soon be ready for the new 1,000 horse power engine. The company intends to be ready for the season of low water, and by putting this engine in now there will be no delay in filling orders when the dry time comes. Nearly every mill in the city is now equipped in a similar manner.

A stranger looking at the dam to-day would never suspect for a moment that the mills here were ever troubled by low water. There is a steady flow of water over the crest of the dam, but it will not last very long, unless we should have an unusually wet season.

Something was the matter with the water wheel at the Wauregan Paper Mill early this week which caused a shut-down for a number of hours.

When the Griffith, Axtell & Cady Company held its annual meeting in the latter part of March F. M. Smith was, as usual, chosen treasurer; but Mr. Smith disposed of his interest in the company one day this week to J. E. Griffith, and the latter is now treasurer. This company was organized about four years ago, but the only member of the original firm now in active service is Mr. Griffith, who owns most of the stock.

Charles F. Quint, formerly of this city, but now connected with the Lithmolite Casket Company, at Westfield, had a serious accident one day this week. While assisting in the removal of some machinery he fell from a scaffold, fracturing his arm and injuring himself internally. He was removed to the City Hospital here. Mr. Quint invented the casket made by his company, the principal material being wood fibre.

Friends of Fred H. Newton, who formerly was connected with the Wauregan and Norman Paper Companies in this city, will be interested in the news which has just reached here that he has been elected Mayor of Ophir, Col. Mr. Newton left Holyoke about two years ago and went to Ophir, where he engaged in mining, becoming manager of a promising mine. He became interested in politics and is now chief executive of his town.

Lottie L. Johnson, formerly connected with the *Transcript* and *Free Press*, will soon issue a history of Holyoke entitled "Holyoke, Past and Present." It will be handsomely illustrated with half-tone engravings, and the sketches will be of interest to residents. Miss Johnson already has orders for 1,000 copies of the book, and she expects to dispose of many more.

William Reardon, superintendent of the Albion Paper Mill, and Mrs. Reardon went to Washington this week to attend the graduating exercises of Georgetown University. Mr. Reardon's son is a member of the senior class.

Bridget Murphy, employed by the Powers Paper Company, had her hand caught in the machinery one day this week and badly crushed.

J. W. Mullin, of Watervliet, Mich., formerly of this city, is desirous of building a paper mill at Norwich, Conn., to cost $40,000, provided that necessary concessions regarding a site and the taxation of the property are made.

F. E. Demond, foreman of the Riverside Paper Company's finishing department, has accepted a similar position with the Agawam Paper Company. H.

MIAMI VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

DAYTON, Ohio, May 9, 1895.

That branch of the paper trade under the supervision of Dayton manufacturers and dealers is now showing a substantial run of business. All departments are busy, and if prices are maintained with the firmness of the past few weeks favorable results are anticipated.

The pulse of manufacturers up and down the valley shows a like condition, not only of the paper trade, but of other industries, some allied and some alien thereto. A restoration of old time business is in view; confidence has been restored to an extent, and unless some national action again interferes, a general and complete duplication of prosperous times of the past will shortly reappear.

It will be remembered that C. F. Gunckel last week applied for the removal of Trustee Wm. H. Todhunter, of the Middletown Paper Company, for the reason that, in the petitioner's opinion, he was not administering to the best interests of all concerned. The matter was set for hearing at a certain date, but was promptly postponed, owing to complications, 'tis hinted.

Since that time one or two other petitions have been filed making similar requests. The creditors who thus evince an interest assert that their claims have been allowed by the courts and that the trustee has not complied with the requirements of the law. Now that others besides Mr. Gunckel have interested themselves the affair assumes a greater prominence, and it is evident that a fight is "on" unless an adjustment is intervening. The present trustee claims that he has disposed of the aggravating entanglements as judiciously, conscientiously and expeditiously as any attorney at law could, under the circumstances, and he arises to remark that if there are any discrepancies, or if there is room for complaint, the fault must have existed prior to his administration. He does not say this much to the court, but modestly requests, by way of an answer, that the complainants be compelled to cite a single justifiable cause for his removal. With this parting reminder that he does not intend to submit quietly, he awaits the action of the court. The case has been set for hearing at a later date.

O. M. Gottschall, of the law firm of Gottschall & Brown, this city, has sent a communication to the probate court of Butler County asking for the removal of Mr. Todhunter because, so stated, Mr. Doty, of the law firm of Doty & Todhunter, is an attorney for other creditors, which fact may cause a partial feeling in the administration. It is thus understood that Messrs. Doty & Todhunter represent creditors whose claims are liable to collide in a legal fray, and that a confusion disagreeable in the extreme may eventuate. Mr. Gunckel desires to withdraw his papers since the arrival of other complaints and the additional requests for the present incumbent's removal. Like the gubernatorial contest, the affair increases in intensity of feeling as time advances.

It has been nearly two years since the Middletown Paper Company's failure, and those who are financially involved are clamoring for a speedy disposition of all claims. Mr. Gunckel is under the impression that he will not only not owe a single copper when affairs are straightened, but that the company will be indebted to him. While there is such a difference of opinion, a more interesting phase of the question will likely arise.

It is obvious that Dr. Davis, who has been airing the ship canal question in Dayton, Hamilton and other cities, has stirred Cincinnatians to preliminary action. The mayor of that city has appointed a committee to agitate the public improvement and arouse interest in the matter. The Engineers' Club, the Manufacturers' Association, the Board of Trade and Transportation, the Young Men's Business Club and the Chamber of Commerce are represented. The Board of Trade has alone juggled the question in Dayton.

Black & Clawson, paper machine manufacturers, Hamilton, this week shipped a mammoth machine to the Kansas City Paper Company. The machinery filled twelve cars.

The W. W. White Paper Company is experiencing a rushing business. Within a

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short time trade has increased over 50 per cent., and the mills are running full forces, a condition which has existed since January. The manager says: "Orders are larger, and there is a disposition among the tradesmen to buy better goods. It looks as though we are going to have a good year's business. We have orders now on hand to run 60 days with a full force and on full time."

On the desks in the uptown hotels are noticed elegant specimen books from the Walker Printing and Lithographing Company, showing, in a sense, the facilities at this company's command. There appear also prominently displayed huge blotters, which completely cover an entire desk and convey to the traveling public the boldly printed information that the Aull Brothers Paper and Box Company, Nos. 222 and 224 West Fifth street, is strictly "in the ring." Its present run on manilla and express paper, and boxes of all descriptions for all classes of trades, is something extraordinary.

Reynolds & Reynolds, blank book manufacturers, East First street, are in the vortex of the spring business cyclone, figuratively. The force has been engaged at night for some time past, and there is no assurance of a cessation at this writing; neither is any desired. Blank book concerns in the valley in general are very busy, preparing for the fall school trade. Orders filled now will probably not be delivered until midsummer or later.

C. M. Harding, of Franklin, has been in Cynthiana, Ky., for the past week looking after the interests of his fast horses. While the owner of "Nightingale" Mr. Harding received considerable attention from turfmen.

William Otterson, of Middletown, has accepted a position as foreman of the White Paper Company's mill. He was formerly engaged at Franklin.

The answer and cross petition of the Harding Paper Company in the case of the Market National Bank *v.* Thos. M. Boyd, trustee of the Louis Snider's Sons Company, has been filed. Briefly, it asks for $1,277.40, with interest from June 26, 1893; $1,413.17, with interest from same date; $1,314 20, with interest from June 27, 1893, and the sum of $1,422.16, with interest from the latter date.

Another suit of more than passing moment will receive its share of trade prominence. It is an action brought by the First National Bank of Lockland *v.* the Merchants' National Bank, the trustee of the Middletown Paper Company and half a dozen other parties interested therein, asking that the aforesaid defendant bank shall be restrained from further prosecuting action, and that the trustee shall be enjoined from paying the Merchants' National Bank dividends; asking also for the appointment of a receiver with authority to collect the dividends. A temporary restraining order was granted, the plaintiff giving a bond.

The petition refers to the amounts of stock held individually by the defendants, and states that on January 27 the plaintiff, in behalf of itself and all other creditors, filed a suit to have determined and assessed the law of statutory liability of stockholders and the amount due from each stockholder, which cause is yet pending. It adds that in order to pay the debt it will be necessary to assess the stockholders 100 per cent. The plaintiff asserts that the dividends allowed S. W. Bord, C. C. Woolworth and I. S. Graham, who held several hundred shares of stock, in equity really belong to all the creditors of the paper company, and that no one creditor can acquire lawfully a superior lien, or right thereto, by attachment or garnisheement, and that if the Merchants' National Bank should be permitted to receive the dividends, the same would work irreparable injury, not only to the plaintiff, but to other creditors as well. Thus the legal grind continues and in every move it seems that a hundred valley and non-resident paper men are interested. Miami Valley courts have always been especially vigorous, and, like certain malts, they "improve with age." M. V.

BOSTON.

[FROM OUR REGULAR CORRESPONDENT.]

EASTERN OFFICE PAPER TRADE JOURNAL,
67 FEDERAL STREET,
BOSTON, May 9, 1895.

What little comes to notice from paper trade circles is of a cheerful and encouraging nature.

Business is not booming, but there is a very fair volume of trade moving from day to day. Those having April returns footed up say that last month's business panned out better than was expected from current movements at the time.

Reports from manufacturers seem to indicate that paper jobbers have the best end of the business at present, as mill orders are said to have become rather limited since the first of the month.

The paper stock market is in statu quo, very little doing and low prices yet prevailing. The imports of paper stock at this port for the past week were hardly of sufficient magnitude to justify reporting.

From a review of the paper industry, published in a Boston daily yesterday, was clipped the following item: "Arrangements are being made whereby foreign rags consigned to paper mills here are to be sorted and baled in the cities from which they come, thus saving considerable handling on this side."

Wondering what this meant, the item was shown to a member of the leading importing paper stock firm of the city with the view of getting posted. "You want to know what that means, do you? Well, it means that the reporter who wrote it didn't know what he was writing about."

The value of paper exported from Boston during the week ended May 3 was $10,135, books, $1,666.

Stone & Forsyth report a very fair business doing, particularly in S. O. S. paper bags. The demand for these bags is said to have largely increased over that of last year, but with additional machinery kept in constant operation orders are being filled without delay. The company having introduced self feeding, automatic printing presses, bags of sizes ranging from one-quarter to 35 pounds are now printed as they drop from the bag machines, and so economically that the charge for printing has been reduced about 25 per cent. All S. O. S. bags are now stamped with new trade marks which Stone & Forsyth, the selling agents, say have received considerable favorable comment from the trade, who are pleased with the distinguishing stamp.

Col. J. P. Jordan, of Pulsifer, Jordan & Co., and Mrs. Jordan will celebrate their silver wedding at their home in Roxbury on the evening of May 20. To look at the genial colonel one would not suppose that twenty-five years of married life could be credited to him. The colonel's oldest son, Robert, is a member of the law firm of Jordan & Currier, in this city. William M., another son, is in the paper business as a broker, with headquarters in Philadelphia, but is a frequent visitor to Boston. The youngest son, Porter Bolles, is a student at Bowdoin. The youngest child, a daughter, died at the age of five years—the first and only great sorrow to cast a shadow over the family hearthstone. This silver wedding will bring together a host of friends who will tender to Mr. and Mrs. Jordan heartfelt congratulations and good wishes.

Mr. Nye, manager of the Cumberland Manufacturing Company, states that a 6,000,000 gallon "Warren" filter plant recently erected at the mills of the Piedmont Pulp and Paper Company, at Piedmont, W. Va., was started up some ten days ago, with good results. He states also that his company has taken an order for a 3,000,000 gallon "Warren" filter plant for P. H. Glatfelter's Spring Grove Paper Mills at Spring Forge, Pa., which is to be set up and completed in two months. A "Warren" filter plant with daily capacity of 2,250,000 gallons for the Rumford Falls Sulphite Fibre Company has just been completed and is all ready for use when the fibre plant gets to producing. A number of smaller plants of the "Warren" filter system have been recently erected for other manufacturing industries requiring pure water, and several plants have been set up for cities and towns to purify the drinking water.

David M. Drury, representing the Wm. Cabble Excelsior Wire Manufacturing Company, of New York, was visiting his Boston trade friends this week.

J. Fred Webster, of Bangor, Me., was in town last Monday.

Other recent trade visitors reported were Henry Richards, of Gardiner, Me.; L. M. Bickford, of Portland, Me.; C. H. Milliken, of Mechanic Falls, Me.; A. C. Moore and John W. Flint, of Bellows Falls, Vt.; Mr. Bartlett, of Nashua, N. H.; Benj. M. Jackson, of Pawtucket, R. I.; W. N. Smith, of Manchester, Conn.; E. C. Wilson, of Rainbow, Conn.; T. E. Barnes, of Plantsville, Conn.; W. J. Warren, of West Dudley, Mass.; Charles S. Mayo, of Lawrence, Mass.; Charles E. Callendar, of Glendale, Mass.; George K. Baird, of Lee, Mass.; Thomas A. Mole, of Fairfield, Mass.; Charles Gage, of Pepperell, Mass.; W. M. Kimball, of Mittineaque, Mass.; James Logan, H. E. Whitcomb, Mr. Williams and Charles S. Barton, of Worcester, Mass.; Edward E. Bill and James Wallace, of Springfield, Mass.; Hon. William Whiting, W. D. Judd, Geo. E. Crafts, L. F. Hayward, W. H. Hayward and Geo. W. Castle, of Holyoke, Mass.; I. C. Blandy, of Schuylerville, N. Y.; W. H. Chapin, of Ticonderoga, N. Y.; William Sheehan, of Oriskany, N. Y.; John E. Waller, of Hart Lot, N. Y.; C. A. Wheden and G. W. Camp, of New York.

Another gentleman met in city trade circles this week was George Pauline, representing Geo. Fletcher & Son, Mill 682, of Stoneclough, Manchester, England. Since the duty on silver tissue paper was reduced the output of this English mill finds a larger outlet in this market, while the domestic article has also fallen in price.

Charles D. Brown and H. M. Whitney are down on the Cape on a fishing excursion. May good luck rest on 'em and the bait hold out! DELESDERNIER.

FOX RIVER VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

APPLETON, Wis., May 7, 1895.

Although various new matters of much interest to the trade have transpired during the past week, which will be referred to later on, the thing of absorbing interest just now continues to be the condition of the water power in this valley. There seems to be some danger that the reports going out about the scarcity of water here may be more damaging than is warranted by the actual condition of things. Already reports have appeared in some of the papers to the effect that many of the workmen in the mills have been laid off, whereas as a matter of fact no such action has been taken, nor is it contemplated. Even with the water at its present low stage the mills are able to do something, although of course not as much as they have been doing, and as many of them are provided with steam engines there is no danger that the Fox River valley will not continue to be a big factor in the paper making industry of the country.

According to the estimate of T. W. Orbison, who is in charge of the matter here, the water in Lake Winnebago has risen 3 inches in the week just past since the new rule about using water went into effect. This corresponds quite closely with the estimate which was made previously about what was to be expected. The principal thing accomplished is the acknowledgment secured from the Government that the rise is coming as expected, which obviates the danger of any further reductions being called for, as was at one time apprehended. There have been copious rains throughout this part of the country during the past few days, and it is yet too early for their effect to be felt in the lake, so that it is hoped that before long the water will be found to be coming up considerably faster than it has during the past week.

The engines ordered for the mills on the river below Neenah and Menasha are not expected to be delivered before August 1, but after that time there will be little difficulty about most of the institutions getting out their full product. No ground wood is now being made on the river, except at the Combined Locks and at the mill of the Little Chute Pulp Company, where part of the grinders are in operation, and as a result a good deal of ground wood is being shipped into this valley from the East. At least twenty cars of it have come in already. It is no new thing for pulp to be brought here from the East, but it has never been necessary until now to do it at this time of the year. The mill of the Combined Locks Paper Company is pretty well situated for water power in comparison to the other mills. The mill made 2,062,000 pounds of paper during the month of April, and 314,000 pounds during the first four days of this month. This mill has no steam power, but it has a monopoly of the water at the point where it is located. Some of the other mills are not so fortunately situated, and are now taking turn and turn about at the water power, some being idle while others are running.

The Thilmany Paper and Pulp Mills, of Kaukauna, are about to make an important enlargement of their establishment. Oscar Thilmany said to your correspondent that all of the details were not yet decided upon, but that he had no objection to having a general idea given of what the company proposes to do. In fine, it is the addition of another tissue machine, which will better enable the mill to keep up with its growing business in this line. The machine, which will soon be ordered, will be between 80 and 90 inches in width, and in all probability a steam engine will be used to operate it in order to secure the most uniform results in making the product. An addition to the present mill buildings will be necessary, and the plans for the structure have been prepared by C. B. Pride, of this city, and have been accepted by the company. They contemplate an addition on the west or up river side of the present buildings, the present west wall being taken out. The dimensions of the addition are to be 36x100 feet, and the addition, like the rest of the mills, will be built of solid stone in the most substantial manner. This enlargement will give the company four paper machines, two of them being tissue machines, and will considerably increase its capacity.

Contractor Pride has also just taken the contract for making an improvement to the water power arrangements of the Appleton Machine Company and a neighboring institution, the old Patten pulp mill, from his own plans. The water has heretofore for many years been conveyed to these institutions through two trunks made of wood between 100 and 200 feet long. According to to the new design an open flume of the same length will be constructed. Excavations will be made to get down to a solid foundation and the work will be of the most substantial character.

The Badger Paper Company, of Kaukauna, last week made an attachment upon the property of the National Wall Paper Company stored in its building, on account of the non-payment of the last quarter's rent, amounting to $1,750. The property consists of the machinery belonging to the National Company, which was formerly operated at Kaukauna by the trust, but which was closed down a year or more ago. The keys of the National Company's apartment are now in the hands of the sheriff, but it is expected that the claim will be settled at an early date.

The Badger people have awarded the contract for moving and setting up their big new sulphite digester to C. B. Pride, of Appleton. The digester is expected to arrive before many more days. It will be 35 feet long and 10 feet in diameter, and the task of getting it in position will consequently be no small one.

Among other things in the way of improvement and advancement which are contemplated by the Fox River Paper Company of this city, most of which have heretofore been spoken of in these columns, is the enlargement of the stuff chests at the Lincoln mill, which will be made necessary by the widening of the paper machine. An addition about 40 feet long will be made on one side of the mill building in order to accommodate the new chests. The plans for the addition and for the chests themselves have been made by Mr. Pride.

E. O'Keefe, of the firm of O'Keefe & Orbison, returned last Saturday from his trip to the East. He was gone about two weeks, and visited many of the paper and pulp making institutions in Maine and other parts of the East, enjoying a very pleasant time and coming back thoroughly informed as to what the rest of the world is doing.

G. R. Hooper, of Chicago, was in Appleton last week, inspecting the boilers at the mill of the Atlas Paper Company.

H. H. Pope, who has for several years been connected with the Manufacturing Investment Company, of Appleton, has been promoted to the position of foreman in the company's mill at Madison, Me., and will take his departure to-morrow for the East. His friends here much regret to lose him.

A. W. Patten has returned from his trip to Mt. Clemens, Mich. J. H. Whorton has also lately been taking the baths there.

F. J. Arlinghaus, of Cincinnati, called on the trade in this valley last week. FOX RIVER.

WESTERN NEW YORK.

[FROM OUR REGULAR CORRESPONDENT.]

NIAGARA FALLS, N. Y., May 8, 1895.

James Davy, a well-known Thorold, Ont., pulp manufacturer, who has a reputation for getting the most and the finest quality of pulp out of his little mill, is jubilant over a new move. I met him this week and he gave the information first hand. He has been turning out some pulp which is used for boxboard, book covers and fibre bags. A new process, so claimed, but an old one in Europe, has been adopted, on suggestion of Superintendent O'Brien, of the Lincoln mills, at Merritton, Ont. Mr. O'Brien has selected young spruce for this process, which is called the boiling process. The wood is barked and prepared at the Davy mill and is then carried down to the Lincoln mill, where it is put through the boiling vats. This colors it a rich brown. It is then taken back to Davy's mill and turned into pulp. It is shipped back to the Lincoln mill again for manufacture into the articles noted above. Over 6,000 bundles have been furnished the Lincoln mills during the past six months. Superintendent Foley, of the Davy mill, says that as the demand for this quality of pulp is increasing a boiling plant will be added to the mill. Mr. Davy bore out all of these facts in my talk with him to-day. The color of the boiled material is a light brown. The pulp has the advantage of being strong enough for all purposes without the aid of sulphite or other chemical matter. There is one drawback, inasmuch as not so much pulp can be made. Mr. O'Brien, of the Lincoln mills, who introduced this process, comes from Lambertville, N. J., and has proved himself a very bright man for the Lincoln Company since he has been connected with it. Superintendent Foley, of the Davy mill, so the proprietor says, is doing splendidly with the mill. All of the Foleys are born pulp and paper makers. One brother is with the Hollingsworth & Whitney mill at Waterville, Me., while another is with the Newtons, at Wellington, N. H. Mr. Davy has two of the brothers with him.

The newly built 120 inch Fourdriniers for the Niagara Falls Paper Company are beginning to arrive from Watertown and will shortly be set up. The rolls from the big cylinder machine will be transferred to the new machines. It is a mistaken idea that

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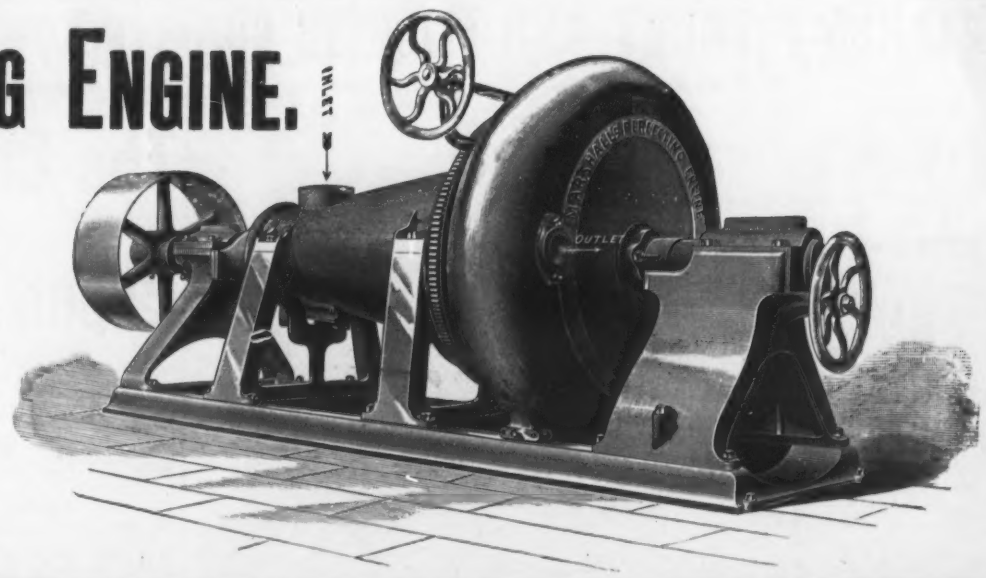

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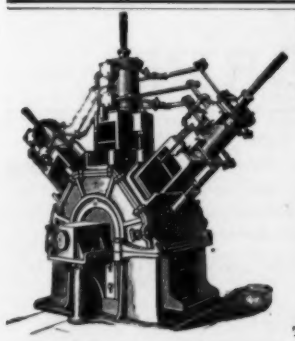

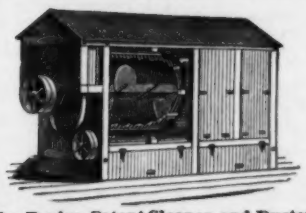

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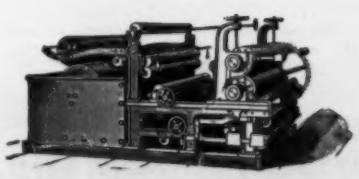

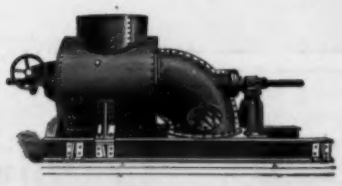

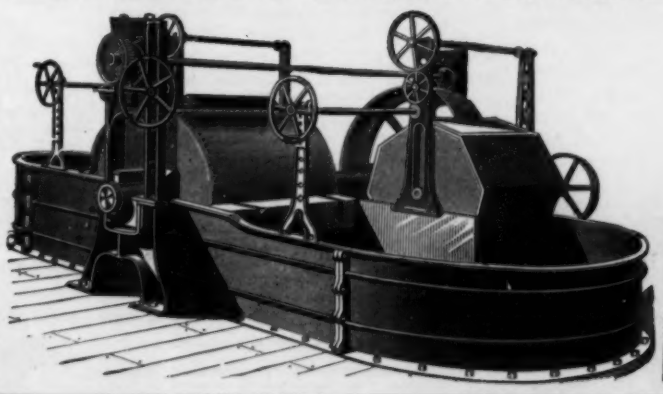

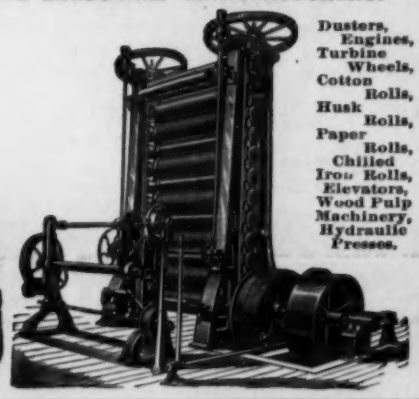

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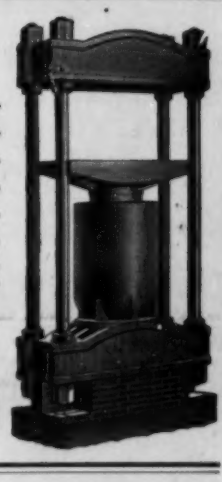

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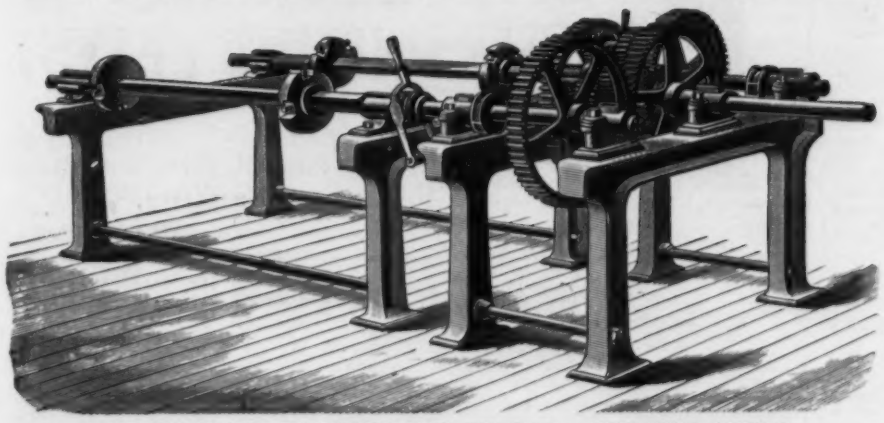

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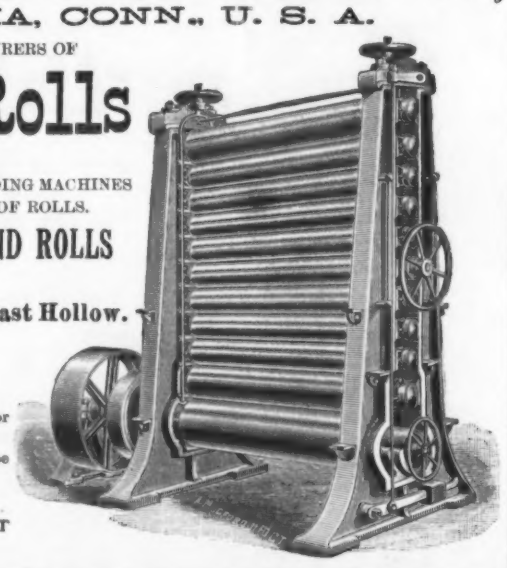

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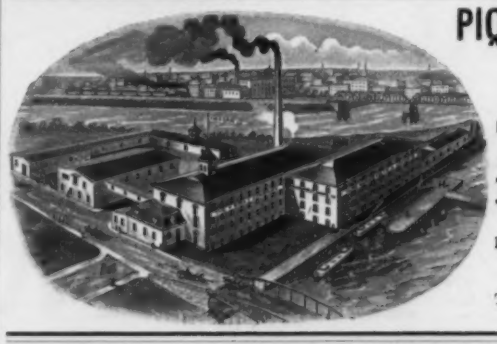

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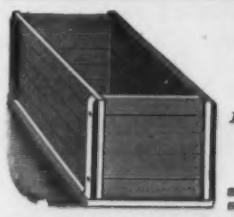

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the company will discard the cylinder machine altogether. President Norton thinks that it had better be kept in stock.

W. E. T.

LOCKPORT, N. Y., May 8, 1895.

The canal boatmen are raising the same old story about the mills taking all of the water out of the canal, to the detriment of the boatmen and the boats. This hue and cry always appears about this time of the year. A canal inspector loomed up here this week, and it is announced that he came for two reasons: one to stop the mill owners from taking water from the canal, and the other to investigate the charges against the lock-tenders. In regard to the former charge, he said that there must be enough water in the canal to maintain the level and not have the boats running aground, and thus kill the horses by compelling them to drag boats along the bottom of the canal because the water is being drawn off down the Eighteen Mile Creek.

The Indurated Fibre Company has ordered a 4 per cent. semi-annual dividend declared on its preferred stock. The affairs of the company are in a very promising shape, and the wages of some sixty of the men in Mills No. 3 and No. 4 have been advanced by President Peterson.

Sponge crepon is becoming popular abroad as well as at home. The Niagara Paper Company, which is the father of this industry, is meeting with success in introducing it on the market. Last week an order was received from Liverpool, England, for ten cases of the crepon, and the factory is being rushed to prepare this shipment.

W. E. T.

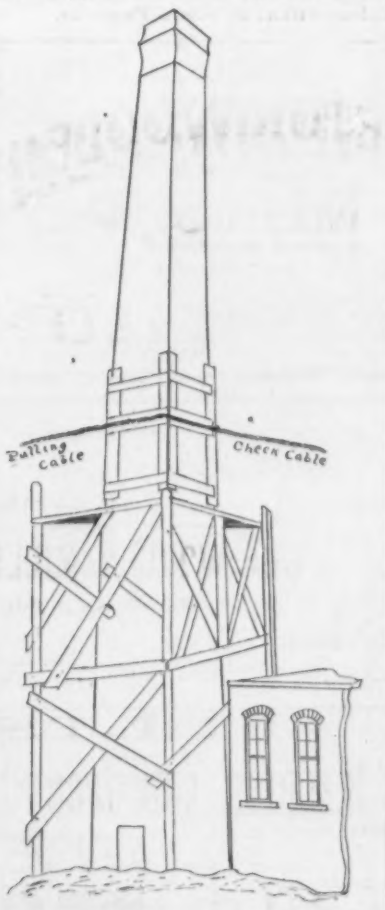
Straightening a Leaning Chimney.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY M. W. DANIELSON.

A leaning chimney is not a pleasant object to look upon, nor is it safe. Most chimneys are built upon solid foundations, but it not infrequently happens that the engineers miscalculate, or the earth deposit is irregular, and chimneys standing on a foundation apparently solid begin to get out of true in a few years.

If the chimney leans too much, so that it is liable to fall, the inspectors promptly condemn it, and down it must come. It often happens that a chimney careens over



STRAIGHTENING A CHIMNEY WHICH LEANED 28 INCHES.

only a dozen inches or so, and there stays. Chimneys of this kind can be straightened. A recent plumbing of a 100 foot brick chimney, 28 inches out of line, at the plant of the Ormsby Textile Company, of Waterford, N. Y., occurred.

The chimney proper is rectangular in plan, is built of brick, is 9 feet 6 inches square at the bottom and 5 feet 4 inches square at the top; it is 100 feet high and has a central flue 3 feet square. The estimated weight of this is 206 tons. It stands upon a foundation which is 14 feet deep, the lower 4 feet being of concrete about 14 feet square, on which rests heavy stonework 10 feet high, 14 feet square at the bottom and 9 feet 6 inches square at the top.

The weight of the foundation is about 149 tons, making a total of 355 tons resting on 196 square feet, about 1.8 tons per square foot.

The method of straightening this chimney was conducted in the following manner: A scaffold was erected about the chimney and eight oak timbers, 6 inches by 10 inches by 10 feet, were placed vertically at the corners at a height of 42 feet above the stonework and 4½ feet below the centre of gravity of the brickwork.

Wire cables were passed around the timbers and another wire rope 2½ inches in diameter, with an eye in each end, was fastened to the first mentioned ropes at its upper eye.

The lower eye was connected with a system of pulleys secured at a point 78 feet distant and directly opposite to the direction in which the chimney leaned, the pulleys being made up of three sets of double and single blocks connected together in series, having three points of fastening to the dock and having eleven pulleys in the system. Cables were also put out from the chimney on each side at right angles to the main cable, and having turn-buckles to tighten them; also a guard cable in the rear.

The earth was then excavated on the high side of the foundation nearly half way around to the bottom of the foundation (a depth of 13 feet) and the main cable was put under strain with the pulleys. By this means, in the course of three weeks, the chimney was brought back about 4 inches.

Then with a post hole digger 8 inches in diameter eleven holes were sunk vertically in the bottom of the trench around the foundation, principally at the highest point, to a depth of 5½ to 6 feet.

From this removal of the earth there resulted within a few hours a righting of the chimney to the extent of 5 inches. This increased to 8 inches by the next morning.

The slack of the pulling rope was taken up as fast as the chimney moved, and the rope was kept under strain.

By tightening up the pulley rope two or three times daily, in a week the chimney was brought back to 8¼ inches.

At this point, in similar manner, the post hole diggers being reduced to 6 inches in diameter, about one-fifth as much more material was removed, immediately followed by righting the chimney to 4 inches, and from that point, after filling the holes with fine broken stone and gravel thoroughly rammed, by continued daily strain on the main cable the chimney was brought back to plumb at the rate of a quarter of an inch per day.

The turn-buckles in the side cables were occasionally used to control any tendency toward lateral inclination.

The work has been accomplished without injury to the structure.

Pumping Coal.

The latest innovation in pumping is to build pipe lines from the Pennsylvania coal regions to the seaboard, and force coal—reduced to a fine state—through the tubing, mixed with water enough to preserve a semi-fluid mass.

There is no doubt that such a method of conveyance would be successful, provided the scouring action on the tubing could be reduced to a commercial point.

In hydraulic dredges the sand and even the softer mud pumped through the plant cuts the pumps and tubes to a serious degree, and although the sharp corners of coal particles would soon be smoothed off, so that the wear on the line would be probably mostly at the inlet end, yet the trouble and expense of renewal, and stoppages due to any break, seem to call for very careful consideration and a good deal of experiment before any very heavy outlay is made.

A good air pump should maintain a vacuum within 1 inch of that due to the temperature of the condenser. With the temperature of air pump discharge at 120° 25.6 inches would be a good vacuum. The efficiency would probably not exceed 50 per cent., or about half an inch of air would be required to raise the valves and overcome friction. Doubling the size of the pump would diminish the pressure of air above that required to lift the valves just one-half and the vacuum would be increased but a quarter of an inch. Similarly with a pump of half the capacity the vacuum would fall off but half an inch. Too large a pump is more objectionable than too small a one, as besides the unnecessary weight, space and steam demanded, it is more irregular in its action; the valves fail to lift for some strokes, and then the pump is flooded. A capacity so small as one-fifteenth of a cubic foot per minute per indicated horse power has worked well in a single acting vertical pump. The velocity of flow through the bucket valves should not exceed 1,000 feet per minute. Foot valves should be of the same area as the bucket valves, and delivery valves larger.

Letters to a Paper Maker.

THE ENGINE ROLL AND BED-PLATE.

BY FERDINAND JAGENBERG.*

(Concluded.)

6.

You are not to be downed, I see. You say that the engine roll and bed-plate develop yet another, a third kind of activity, namely that of tearing, and you explain this correctly by the fact that the bed-plate, being stationary, endeavors to retain all of the rags and portions of stuff which the roll draws over it.

The forces which exert themselves on one and the same body simultaneously, but in different directions, cause a tear or rupture at the moment when they, the forces, have become greater than the internal cohesion of the objective body. The tearing action is evidently exerted mainly by the roll and bed-plate of the half stuff engine, and it is necessary therefore to construct these with due regard to the tearing function which they should exert in reducing the rags. In constructing beaters the utilization of this particular feature may be ignored, as the tearing of the small elementary fibres is probably out of the question. As it had been our original intention to examine only the action of the roll and bed-plate of beating engines, we may with easy conscience save ourselves the trouble of a closer investigation of the laws underlying the tearing process, and be satisfied with the knowledge that it is the crushing process which enters mainly into our subject, and that it is rendered the more important by the fact that it influences the cutting process.

I have demonstrated to you that the number of cuts made in a given length of time does not alone develop the effect of the cutting process, but that the latter depends also on the pressure with which the shear blades (in this case the knives of the roll and bed-plate) pass over each other. This pressure equals exactly that of which I have given you an idea by defining the unit of superficial pressure. You may resist as much as you like, but what is true remains true, and I repeat what I cannot impress on you too much, namely: That the cognizance of the superficial pressure of the roll and bed-plate of each engine is the more important and advantageous, for the mill owner as well as for the engineer, as it reveals all of the secrets of the beating process.

I beg you to agree with me that it makes a great deal of difference whether you use a roll and bed-plate making a large number of cuts under low superficial pressure, or one which makes few cuts under high superficial pressure. Under certain conditions the cutting capacity of the latter may be greater than that of the former. It is by no means immaterial, however, whether a roll and bed-plate, the superficial pressure being the same, make few or many cuts.

All advantages or drawbacks must be considered in constructing an engine, and the whole must be made to harmonize so as to answer the ends in view.

You will, I think, remember the roll and bed-plate No. 1, which I used as an example in my last letter. Its superficial pressure of 10.05 kilograms per square centimetre would remain the same, even if the bed-plate should consist of one single block of 5×18 = 90 millimetres with smooth surface. In this case, however, each knife on the roll would make only one single cut with the bed-plate at each revolution, and this would greatly reduce the capacity of the engine. For this reason we break up the block and divide it into separate bars or knives, which we place at some distance from each other. We are at liberty to choose the knives 1, 2, 3, 4, 5, 6 or more millimetres thick, so as to obtain 90, 45, 30, 22, 18, 15 or less knives. What will be the consequence? The superficial pressure will remain the same, namely, 10.05 kilograms; the number of cuts will increase according to the number of knives. The effect of each single cut will, however, remain the same, whether 90 or only 15 cuts are made. The more we divide the surface of the bed-plate the more we increase the number of cuts, and in a like degree the capacity of the engine.

You, as a practical paper maker, know that there is a limit to the division of the bed-plate. The single knives must remain strong enough to withstand without being broken or bent the knocks of the roll and lumps of stuff, or whatever impurities may get between them. Although for the middle of the bed-plate knives of 3 mms. thickness may possess sufficient power of resistance, it will be well to protect such a group in front and behind by means of bars from 8 to 10 mms. thick. The thickness of the knives will also depend on how far they are to project above the filling between them. The proportion of the projection of the knives to the distance between them is of importance in more than one respect. Many errors are made in this connection, and many a paper maker has condemned the arrangement of the knives and filling in a bed-plate because he had chosen the wrong proportion. If the separate knives are placed too closely to each other, and at the same time are allowed to project too far above the filling, the stuff is apt to settle between them and to completely fill up the intermediary spaces, so that the surface of the bed plate becomes perfectly smooth. The knives then lose their cutting power, and the unit of superficial pressure is, moreover, considerably reduced. Suppose that our bed-plate No. 1 had become thus stopped up. It consisted of:

18 knives of 5 mms. each ..... 90 mms.
18 pieces of filling of 10 mms. each .. .. 170 mms.

Total..... 260 mms.

The surface over which the pressure of the roll would distribute itself on the stopped up bed-plate would have increased to 260 mms., or 26 centimetres, with the following result:

$$W = \frac{1170 \times 298.45}{80 \times 48 \times 26} = 3.48 \text{ kilograms.}$$

The unit of superficial pressure will have been reduced from 10.05 to 3.48 kilogs. The same thing would result if the knives were allowed to wear down level with the filling, and work should be continued without raising the knives or cutting down the filling.

I remember having told you of our mutual friend S——, who abhors the so-called sharpened engine knives from the bottom of his heart, but uses them, nevertheless, in his bed-plates, because the stuff is really less apt to settle in the spaces formed by such knives, as they are wider at the top. He would, according to my humble opinion and experience, obtain just as uniform and reliable results if he used unsharpened knives and placed them at least twice as far apart as they project above the filling. Reverse this arrangement, as is done in most cases, and you may be sure that you will very soon be troubled with stopped-up bed-plates. An arrangement of the bed-knives like that adopted by Korschilgen will tend even more to retain the stuff than parallel vertical knives, because the intermediary spaces become narrower toward the roll, and the stuff can enter them easily, but leaves them with difficulty. Wide intermediary spaces may, however, help also in this case.

There is not so much danger of the pulp settling between the projecting knives of the roll as between those of the bed-plate. The natural centrifugal force which the fast revolving roll imparts to the stuff is a sufficient guaranty against this. One might therefore be tempted to believe that the division of the roll knives, in order to increase the cutting capacity, could be carried to any extent; but you know as well as I that this is not the case, and you are even better acquainted than I with the reasons therefor. I shall, nevertheless, say a few words regarding the matter.

The roll in connection with the bed-plate carries on the beating process, and in addition to this, and without the assistance of the bed-plate, it has to propel the stuff in the engine tub. For this latter purpose its knives serve as scoops; forming with the adjoining backfall and the body of the roll a number of cells or buckets, which scoop in the liquid stuff and lift it over the crest of the backfall. The larger these cells and the oftener they empty their contents over the top of the backfall the better, one would say, should be the engine draw, or the better should be the circulation of the stuff.

Suppose the backfall to be close up against the roll, and you would be able to calculate the quantity of stuff moved from the number of revolutions and the convex surface of the imaginary cylinder, which surrounds the body of the roll at the height of the projecting knives, deducting, of course, the space taken up by the knives themselves. The quantity moved would be contained in the following formula:

$$Z\,L\,H\,[\pi\,(D-H)-Sr]$$

which means:

Z, the number of revolutions of the roll per minute.
L, the length of the roll.
D, the diameter of the roll.
H, the projecting height of the knives.
Sr, the total thickness of all the knives of the roll.

The size of the cells would therefore depend mainly on the greater or less projection of the knives above the body of the roll. In case you should wish to avail yourself of this fact, you would be bound to regulate the thickness of your knives in accordance with the distance that they project, choosing thicker knives if they project far, and thinner knives if they project little. Tell me, why do you flute the body of the roll between the knives, or cut it sloping from one knife to the other? Undoubtedly in order that, aside from obtaining as large a cell as possible, you may provide a strong support for the knives. Your solicitude to give your knives sufficient power of resistance thus puts a limit to their division and number with regard to obtaining a larger number of shear cuts.

You know that I have undertaken to construct a roll which will meet the requirements for a larger number of cuts, without materially impairing its lifting capacity. I give a cut of it in Fig. 9.

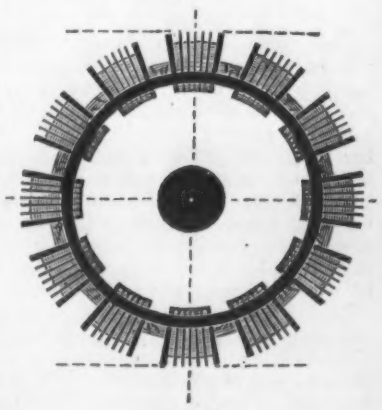


FIG. 9.

Five knives of our roll No. 1 are in this case grouped together. While I have left the two outside knives of each group of their original thickness of 8 mms., I have divided the three intermediate knives, with a total thickness of 3 × 8 = 24 mms., into five knives, so that each of these is now 4.8 mms. thick. I thus obtain 12 groups, each with

2 knives 8 mms. thick = 24 knives
5 knives 4.8 mms. thick = 60 knives

or a total of..... 84 knives.

Suppose that our roll No. 1 made 150 revolutions per minute; we would in that case with sixty roll knives and eighteen bed-knives obtain 60 × 18 × 150 = 162,000 cuts per minute. The new roll above described would, however, make 84 × 18 × 150 = 226,800 cuts in the same length of time, or 64,800 cuts more per minute. The cutting capacity of the roll has therefore been considerably increased, while, by the way, the unit of superficial pressure has remained exactly the same as before, viz., 10.05 kilogs. I will not omit to request you to look again at the cut, and to call your attention to the fact that, in conformity with my words, all of the thinner, weaker knives are strengthened with wooden keys which reach high up, while between each two end knives there are wide and deep spaces. In this way the whole group of knives serves as a scoop for propelling the stuff, while the component parts of the different groups do the cutting.

"But why all this talk about the division of the roll knives," you will say, "if we can help ourselves so much easier by increasing the speed of the roll; for the faster the roll revolves, the larger the number of cuts?" You are of the opinion, moreover, that the faster the speed of the roll, the better will be the circulation of the stuff.

Gently, my friend! Consideration for the circulation of the stuff in the engine is exactly what puts a limit to the speed of the roll. Of course, the action of the scoops will, at twenty revolutions per minute, be double what it would be at ten revolutions. We cannot, however, deal with such small figures. If we increase them to the proper limit the centrifugal force which the violently revolving roll transmits to the contents of the engine comes into play. This centrifugal force spoils our calculation, as it throws the stuff with great force against the hood over the roll, and thus impedes the current of the stuff which follows. To this must be added the inertia of the pulp, and if a large portion of the stuff scooped up by the roll is carried around with it and drops again in front of the roll, will you then dare to assert that this stuff has flowed through the tub? These evils grow as the centrifugal force or the circumferential velocity of the roll increases.

As in this way a portion of the stuff passes over the backfall and continues its proper course, but the other portion is again thrown before the roll to pass a third time between the roll and bed-plate, thus receiving its double share of treatment, it is quite clear that the hurling of the stuff around the roll must be considered equivalent to uneven beating. It would be different if we could select for a trip around the roll those particles of the stuff which require double as vigorous treatment as those other fibres which quietly continue on their way.

With this I shall close. If I consider what and how much I have written about these simple pieces of machinery, "The Engine Roll and Bed-Plate," I would hardly think it possible that I could have started in on it. It is true that you have repeatedly told me that there are many weeds among the flowers, but I am quite willing that you should pull up and throw away all of these, and I shall be content and happy if you find only one little flower worth cultivating. This little plant, I hope, you may, for old friendship's sake, nurse lovingly.

*Translated for THE PAPER TRADE JOURNAL by special arrangement with the author.

If you have a low water alarm on your boiler, take good care of it at all times, but do not depend upon it to do your work for you, as it may fail when needed the most.

New Inventions—LXXVIII.

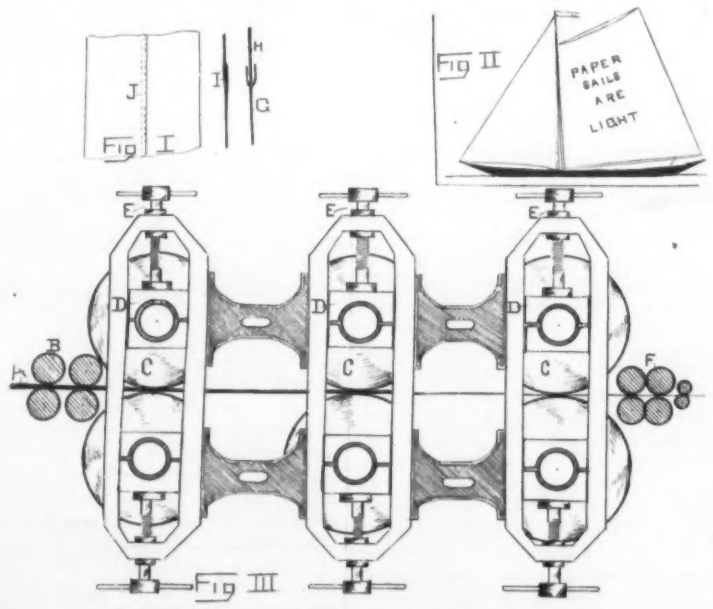
[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By Geo. Damon Rice.

It is now quite certain that a paper pulp composition will be employed in making sails for light vessels. The Herreshoffs, builders of racing boats, have lately experimented with the application of rubber to balloon and other light sails, the operations being carried on at the Bristol Rubber Works. The value of a big spreading sail in going before the wind is known to yachtsmen, which, together with a bulging balloon jib topsail, utilizes every ounce of wind in force. The idea in view in making these sails of rubber is to obtain an elastic material which will allow the sails to increase in area and consequently in propulsive power in proportion to the force of the wind. Canvas sails have heretofore been used exclusively, but as a lighter, more elastic and air tight material is desired, the proposition at present is to make the sails of gossamer weight from rubber, rope them strongly along foot, luff and leach, resulting, it may be, in superior sails.

Even rubber has its drawbacks. A sudden increase of wind power expands the sails too much, and difficulty is experienced in governing the course of the boat; so attention has been turned to that unfailing source from which so many things are now made—paper. A chief reason for the employment of paper stock for this purpose is lightness, a matter which counts for considerable in fast sailing vessels; but there are other points of superiority, one being that the composition stretches just about enough to favor both wind power and vessel while another is that the paper sails are air-tight. Besides this, practical tests have shown that the paper, properly prepared, is very durable and is less liable to tear in case of high winds. The sails made on this new plan are not woven from strands or threads, but are made up from compressed sheets, these being cemented and riveted together in such way as to form a smooth and strong union. The first process of manufacturing consists in preparing the pulp in the regular way, to a ton of which is added 1 pound of bichromate of potash, 25 pounds of glue, 32 pounds of alum, 1½ pounds of soluble glass and 40 pounds of prime tallow, these ingredients being thoroughly mixed with the pulp. Next the pulp is made into sheets by regular paper making machinery, and two sheets are pressed together with a glutinous compound between, so as to retain the pieces firmly, making the whole practically homogeneous.

The next operation is quite important and requires a specially built machine of great power constructed after the plan exhibited in Fig. III., in which A marks the sheet of pulp entering the rollers B, at which stage the sheet is flabby and thick. Gears revolve the series of heavy compression cylinders C, C, C, drawing the sheet of pulp between, compressing it firmer and thinner as the edge of which is split so as to admit the edge of the other sheet H. When the split is closed, cemented and riveted or sewed it closes completely and firmly, as in I. A sewed union is seen in J. Fig II. represents a boat fitted with paper sails. Good canvas sail stock is by no means cheap, while rubber material is quite expensive. Paper is cheap, and paper sails can be produced at comparatively low expense, so that they could not only be available to



Compression Cylinders of Paper Sail Making Machine.

operation proceeds, so that when the sheet emerges from the delivery rollers F it is quite thin and solid. The frames D, D, D are strong supports for the cylinders, and the former are set in a powerful frame of iron. The cylinders are heated. Next the now solid sheet is run through a bath of sulphuric acid to which 10 per cent. of distilled water has been added, from which it emerges to pass between glass rollers, then through a bath of ammonia, then clear water and finally through felt rollers, after which it is dried and polished between heated metal cylinders. The paper resulting from this process is in sheets of ordinary width and thickness of sail stock, it is elastic, air tight, durable, light and possessed of other needed qualifications to make it available for sail making.

The mode of putting the sheets together is seen in Fig. I., in which G represents a sectional view of a part of the sheet, the owners of racing boats, but to ordinary shipmasters.

A method of removing sticky deposits of grease and dirt from parts of machinery by means of soda lye is quite extensively employed in England. To 1,000 parts by weight of water are taken about 10 or 15 parts caustic soda and 100 parts ordinary soda. This mixture is boiled and the parts of the machinery to be cleaned are placed in it, when all grease, oil and dirt are quickly loosened. It is then necessary to wash the metal and dry it well. The action of the lye is to form with the grease soaps soluble in water. To prevent the lubricating oil, &c., hardening upon the parts of the machinery when in use, it is necessary to add a third part of kerosene, and it is well, also, to oil with kerosene from time to time.

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Imports and Exports.

IMPORTS AT NEW YORK.

FOR THE WEEK ENDED MAY 3, 1895.

An. Colors..	984	$63,142	Paper	688	$25,906
Alum	39	108	Steel Pens..	4	4,466
Alum's Cake	—	—	Stationery .	8	232
Bl. Powders	744	12,591	SlatePencils	35	344
Soda Ash...	5,134	12,491	Clay	—	966
Soda, Caus.	346	4,474	J'te B'ts,&c.	13,326	32,171
Soda, Sal....	140	304	P.Hangings	25	915
Soda, Hypo.	25	267	Pap'r Stock	3,702	37,797
Ultramarine	100	3,151	TerraAlba.	—	—
Books.....	214	26,772	Waste.....	60	6,834
Newspapers	156	9,463	Wood Pulp	823	5,953
Engravings.	93	7,694			
Ink.....	234	2,121			
Lead Pencils	5	1,983	Totals...	26,975	259,542

Imports General Merchandise for the week ended May 3, 1895..... $6,988,065

IMPORTS OF PAPER STOCK AT NEW YORK.

FROM JANUARY 1 TO MAY 8, 1895.

Whence Imported.	*Rags.*	*Old Paper's.*	*Chemical Fibre.*	*Ground Wood.*	*Manilla Stock.*
	Bales.	Bales.	Tons.	Tons.	Bales.
Antwerp.....	2,072	5	725	....	7,217
Bordeaux.....	181	....	....	....	850
Bremen.....	831	725	2	....	2,321
Bristol.....	....	...	....	....	1,733
Buenos Ayres.	530	....	....	....	....
Calcutta.....	....	...	....	....	5,471
Cen. America.	180	....	....	....	....
Christiania....	....	....	85	....	....
Copenhagen..	...	....	105	....	1,098
Dundee.....	....	....	1	....	474
Fiume	....	....	34	....	....
Genoa.....	629	....	....	....	2,311
Ghent.....	90	40	....	....	395
Glasgow.....	123	28	....	....	49
Hamburg.....	4,996	174	783	....	733
Havre.....	....	....	....	....	682
Hiogo.....	6,544	....	....	....	....
Hull.....	2,333	40	1,616	....	2,377
Kobe.....	10,578	....	....	....	....
Leghorn.....	958	....	....	....	185
Liverpool.....	594	147	....	....	7,038
London.....	2,309	1,068	....	....	2,193
Marseilles	155	....	30	....	715
Newcastle	....	221	....	....	2,167
Rotterdam....	1,873	....	67	....	891
Stettin.....	401	....	30	....	535
Trieste.....	123	....	45	....	....

NEW YORK IMPORTS.

FROM MAY 1 TO MAY 8, 1895.

Paper Stock.

Castle & Gottheil, Noordland, Antwerp, 19 tons chemical fibre.

James Pirnie, E. J. Spicer, Antwerp, 245 bs. bagging.

Train, Smith & Co., Kansas City, Bristol, 394 bs. manillas.

J. W. Mason & Co., by same, 33 bs. manillas.

Lewy Brothers, Albano, Hamburg, 339 bs. rags.

F. Salomon & Co., by same, 128 bs. rags.

S. Goldman, by same, 4 tons chemical fibre.

Train, Smith & Co., by same, 248 bs. bagging.

Lewy Brothers, Persia, Hamburg, 262 bs. rags.

H. O. Bateman, Pocasset, Fiume, 14 tons chemical fibre.

James Pirnie, La Normandie, Havre, 100 bs. bagging.

James Pirnie, Nomadic, Liverpool, 805 bs. bagging.

Castle & Gottheil, England, London, 70 bs. rags.

C. S. Rider, by same, 160 bs. papers.

Train, Smith & Co., by same, 298 bs. bagging.

Merchants' Dispatch, by same, 75 bs. rags.

J. W. Mason & Co. Norge, Stettin, 69 bs. manillas.

Paper.

W. H. S. Lloyd, Teutonic, Liverpool, 6 cs. hangings.

F. Beck & Co., Furnessia, Glasgow, 8 bs.

Oscar Melvin, Noordland, Antwerp, 1 cs.

Kupfer Brothers, by same, 34 cs.

Photo Material Company, by same, 15 cs.

C. S. Abbott, by same, 23 cs.

L. C. Wagner, by same, 2 cs.

American News Company, Albano, Hamburg, 73 bs.

L. De Jonge & Co., by same, 27 cs.

B. Lawrence Stationery Company, by same, 3 cs.

Druckleb & Co., La Normandie, Havre, 46 cs.

E. Fougera & Co., by same, 56 cs.

G. J. Kraft, by same, 1 cs.

G. H. Barbey, by same, 5 cs.

J. Dickinson & Co., Umbria, Liverpool, 3 cs.

Thomas Glenn, by same, 4 cs.

Kupfer Brothers, Zaandam, Rotterdam, 16 cs.

L. De Jonge & Co., by same, 6 cs.

W. Seyd, by same, 2 cs.

G. Gennert, by same, 2 cs.

L. De Jonge & Co., Hindoo, Hull, 39 cs.

H. S. Leclercq, by same, 26 cs.

Henry Griffin & Son, by same, 9 cs.

Knauth, Nachod & Kuhne, by same, 7 cs.

John Hunter, by same, 12 cs.

C. D. Stone & Co., Mobile, London, 2 cs.

Henry Bainbridge & Co., by same, 7 cs.

Thomas Glenn, by same, 8 cs.

BOSTON IMPORTS.

FROM MAY 2 TO MAY 8, 1895, INCLUSIVE.

Paper, &c.

Wm. Guild & Co., Pavonia, Liverpool, 6 bs. periodicals.

W. A. Nosworthy, Sylvania, Liverpool, 10 cs. paper.

Thomas Groom & Co., Carlisle City, London, 2 cs. paper.

Paper Stock.

Train, Smith & Co., Peruvian, Glasgow, 70 bs. waste paper.

Horace Dutton & Co., by same, 114 bs. waste paper.

Baring Brothers & Co., Columbian, Liverpool, 38 bs. manillas.

Train, Smith & Co., Carlisle City, London, 5 bs. rags.

Castle & Gottheil by same, 38 bs. waste paper.

Horace Dutton & Co., by same, 112 bs. rags, 143 bs. waste paper.

Wheelwright Paper Company, by same, 238 bs. waste paper.

Crocker, Burbank & Co., by same, 275 bs. waste paper.

Sizing.

E. W. McClintock, Sylvania, Liverpool, 266 bags.

Train, Smith & Co., Carlisle City, London, 1 bag.

J. W. Barlow, Michigan, Liverpool, 32 bs.

Bleaching Powder.

J. L. & D. S. Riker, Michigan, Liverpool, 293 cks.

Caustic Soda.

Edward Hill's Sons & Co, Columbian, Liverpool, 600 drums.

J. L. & D. S. Riker, Michigan, Liverpool, 150 bbls and 25 drums.

Soda Ash.

Warren & Co., Michigan, Liverpool, 117 cks. and 160 bags.

A. Klipstein & Co., by same, 21 cks. and 100 bags.

Wing & Evans, Pavonia, Liverpool, 63 cks. and 400 bags.

Wing & Evans, Columbian, Liverpool, 39 cks. and 800 bags.

Alkali.

Jerome Marble & Co., Columbian, Liverpool, 900 bags.

Soda Crystals.

Warren & Co., Michigan, Liverpool, 140 bbls.

Crude Sulphur.

Linder & Meyer, Columbian, Liverpool, 1,668 bags.

PHILADELPHIA IMPORTS.

FOR THE WEEK ENDED MAY 4, 1895.

Paper.

Chas. Beck Paper Company, Moravia, Hamburg, 1 pkg.

Paper Stock.

Order, Switzerland, Antwerp, 593 bs. wood fibre.

Soda Ash.

Brown Brothers & Co., Indiana, Liverpool, 334 bags and 197 cks.

Order, by same, 109 tcs., 1,200 bags and 294 cks.

Soda Crystals.

Order, Indiana, Liverpool, 140 cks.

Bleaching Powder.

Order, Indiana, Liverpool, 101 cks.

Salt Cake.

Brown Brothers & Co., Indiana, Liverpool, 106 cks.

Sizing.

Lawrence Johnson & Co., S. M. Bird, Havana, 220 bs. hide clippings.

EXPORTS of Paper, &c., from New York for the Week Ended May 7, 1895.

BOOKS, to Southampton, 5 cs.; San Domingo, 3 cs.; Belgium, 8 cs.; Argentine Republic, 28 cs.; Brazil, 31 cs.; British Guiana, 4 pkgs.; British West Indies, 12 cs.; Chili, 3 cs.; Bremen, 9 cs.; British Australasia, 8 cs.; Cuba, 5 cs.; Central America, 2 cs.; China, 2 cs.; Danish West Indies, 1 cs.; Dutch West Indies, 1 pkg.; Hamburg, 3 cs.; Havre, 1 cs.; Leeds, 53 cs.; London, 28 cs.; Malmo, 1 cs.; Newfoundland, 12 cs.; Nova Scotia, 1 cs.; Prague, 13 cs.; Rotterdam, 1 cs.

PAPER, to Rotterdam, 2 cs.; St. Petersburg, 100 cs.; Belgium, 156 cs.; Argentine Republic, 10 cs.; Brazil, 185 pkgs.; British East Indies, 10 cs.; Bremen, 4 cs.; Cuba, 24 cs.; British West Indies, 268 pkgs.; British Australasia, 749 cs.; Central America, 8 pkgs.; Canada, 1 cs.; Danish West Indies, 3 pkgs.; Dutch West Indies, 17 pkgs.; Hamburg, 34 cs.; Hayti, 5 pkgs.; Liverpool, 1 cs.; London, 109 cs.; Mexico, 26 pkgs.; New Zealand, 198 pkgs.; Newfoundland, 1 cs.; Peru, 4 bdls.; San Domingo, 119 pkgs.; Venezuela, 11 pkgs.

STATIONERY, to Peru, 1 cs.; Southampton, 1 cs.; San Domingo, 4 cs.; Argentine Republic, 13 cs.; Brazil, 59 cs.; Berlin, 3 cs.; British East Indies, 1 cs.; British West Indies, 10 cs.; Bremen, 2 cs.; British Australasia, 18 cs.; Danish West Indies, 5 cs.; Hull, 1 cs.; Christiania, 8 cs.; Cuba, 12 cs.; Dutch West Indies, 2 pkgs.; Ecuador, 1 cs.; Hamburg, 1 cs; Hong Kong, 12 cs.; Hayti, 5 cs.; Leipsic, 3 cs.; Liverpool, 2 cs.; London, 34 cs.; Mexico, 7 cs.; Naples, 2 cs.; New Zealand, 1 cs.; Newfoundland, 4 cs.; Uruguay, 1 cs.; Colombia, 2 cs.; Venezuela, 11 pkgs.

SANDPAPER, to Argentine Republic, 57 cs.; Cuba, 2 bdls.; Intra, 5 bs.; Brazil, 5 bs.; Mexico, 6 bs.; New Zealand, 1 cs.

TWINE, to Argentine Republic, 33 bs.; Bristol, 45 bags; Cuba, 2 bs.; Brazil, 55 bbls.; British West Indies, 17 bs.; China, 1 bale; Copenhagen, 192 pkgs.; Danish West Indies, 1 bale; Glasgow, 493 bags; Liverpool, 628 bags; Mexico, 3 bs.; Nova Scotia, 1 bale; Odessa, 253 bags; Peru, 1 bale; Venezuela, 2 bs.

WALL PAPER, to Hayti, 1 cs.; Mexico, 48 pkgs.; Nova Scotia, 1 pkg.

TAGS, cases, to Brazil, 1.

LABELS, to Argentine, Republic, 1 pkg.; British West Indies, 1 cs.; Dutch West Indies, 1 cs.

CARDBOARD, cases, to Brazil, 1; Venezuela, 1.

AGGREGATES AND VALUES.

Paper, reams.....	—	—
Paper, pkgs.....	918	$6,392
Paper, cases.....	511	4,982
Books, cases.....	231	16,516
Stationery, cases.....	216	12,754
Rosin, bbls.....	3,606	12,184
Totals.....	5,482	$52,828

Exports General Merchandise for the week ended May 7, 1895..... $7,328,501

Locations for Industries.

The name of the Chicago, Milwaukee & St. Paul Railway has long been identified with practical measures for the general upbuilding of its territory and the promotion of its commerce, hence manufacturers have an assurance that they will find themselves at home on the company's lines.

The Chicago, Milwaukee & St. Paul Railway Company owns and operates 6,154 miles (9,900 kilometres) of railway, exclusive of second track, connecting track or sidings. The eight States traversed by the company—Illinois, Wisconsin, Northern Michigan, Iowa, Missouri, Minnesota, South Dakota and North Dakota—possess, in addition to the advantages of raw material and proximity to markets, that which is the prime factor in the industrial success of a territory—a people who form one live and thriving community of business men, in whose midst it is safe and profitable to settle. Many towns on the line are prepared to treat very favorably with manufacturers who would locate in their vicinity.

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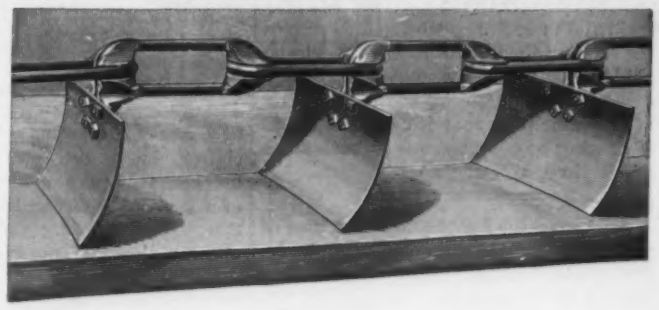

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NEW YORK: SATURDAY, MAY 11, 1895.

A MACHINE for applying paste to paper in lengths is illustrated and described on the first page of this issue of THE PAPER TRADE JOURNAL. It will be evident to anyone who reads the description and understands the operation of the machine that it can be applied to coating or coloring one or both sides of a strip or roll of paper.

AN apparatus for the manufacture of acetylene gas is illustrated and described in another column. This gas is formed by the decomposition of certain carbides when brought into contact with water, calcium carbide presenting the greatest commercial possibilities, because of the low cost of material, the abundance of supply and the value of the by-product. In addition to its desirable quality as an illuminant, acetylene gas can be used commercially for power and heating purposes; and, in the form of a liquefied gas it will be invaluable for such uses.

THE general return to better business conditions is felt in the paper trade as well as elsewhere. Reports from paper manufacturers and allied trades, and the correspondents of THE PAPER TRADE JOURNAL and *The American Stationer*, indicate a better tone and feeling throughout the trade, an improvement in demand and an inclination to stiffen prices. Many mills are working at their full capacity and all appear to have regained confidence in the future of the industry. No other product enjoys such a degree of intimacy with every department of business as paper; in one way or another it is an article of necessity and an item of expense to every business man in the country, and naturally it would be among the first to feel the effects of returning prosperity. We have never believed that any sudden boom would take place after the long depression; circumstances were all against it, and we have so advised our readers. Events are justifying our course in many ways, especially in the slow, steady and permanent recovery of general business, which must become as well defined in the trade which we represent as it is gratifying to all concerned.

THE formation of great corporations with enormous capital to carry on a great variety of enterprises looks to the casual reader a very unimportant matter. Many, without thinking deeply on the subject, may give such undertakings their approval. It would be better, however, if a little more careful and thoughtful attention were given to schemes which, while outwardly veiled in the modest purpose to benefit the people and country, are too often a covering for bold ambitions and far reaching power. Such, we conjecture, is the real purpose of an organization recently incorporated under the laws of Illinois, the duration of which is to be ninety-nine years and the capital stock $200,000,000, divided into 2,000,000 shares of $100 each. The interesting section of the charter reads as follows:

To construct, equip, own, operate, lease, purchase, bond and mortgage, and sell electric railways, both surface and elevated, and electric telegraph, telephone, and signal lines in connection with said railways; to acquire, own, use, sell and license others to use inventions and letters patent for improvements in electric railways, cars, motors, brakes, trolleys, telegraph, telephone and signal devices and other equipments thereof, and inventions and letters patent for improvements in railway passenger coaches, sleeping cars, freight cars, express cars, mail cars, fruit cars, refrigerator cars and stock cars; to construct, lease to others, use, and sell said improved cars, motors, brakes, trolleys, and all other equipments for railway service, and to promote the formation of companies for introducing and using said improvements, or any of them, in any part of the United States and in foreign countries; also to manufacture, acquire and use power of all kinds in connection therewith; also to manufacture, purchase and sell water power and electric power; also to construct, equip, own, operate, lease, purchase and sell electric light plants; also to construct, purchase, lease, sell and operate water rights, canals, ditches and dams; also to acquire and own sufficient land for carrying out the purpose herein specified; also to issue bonds and mortgages, and property and franchises.

A careful reading of this singularly comprehensive scheme will show that in one way or another it may, and doubtless will, if carried out, affect almost every industry and business in the country—general trade by a monopoly of the means of communication, and productive industry by a monopoly of water power, electric power, water rights, dams, &c. The enterprise is incorporated under the specific name of the "Inter-Ocean Electric Railway Company," but by the terms of its charter there is no kind of business which it may not enter upon in any and every State of the Union.

THE improvement in business which has been noticed in these columns from week to week continues, the volume of trade expanding and making itself felt in industrial and commercial centres most encouragingly. The past week has had its gratifying measure of cheering incidents, chief among which was the advance in the Treasury gold reserve from $92,591,579 to $96,039,869, the largest single payment made by the syndicate. In this connection may be mentioned also the repayment by the managers of the bond syndicate of $12,000,000 of gold advanced by subscribers to the $30,000,000 advanced for the payment of one-half of the new loan, it not being needed to enable the managers to meet their obligations to the Government. This returns $12,000,000 to active use in business and investments. Foreign exchange in London has declined 2 cents per pound sterling, with no advance as yet in loaning rates for money. At the close of the day, May 9, the general Treasury balance was $182,584,615. Customs receipts for the same day were $1,115,829. Another unimpeachable sign of reviving business activity is in the numerous applications to the Controller of the Currency for authority to establish new national banks, the increase showing a turning point after a long period of declension. The number of banks organized during the six months since the last report from the Controller is fourteen, and thirty-one applications are now pending, the aggregate capital of which is $3,610,000. The increase in bank circulation for the month of April was $2,178,779. This is certainly strong proof of a growing demand for money to be used in active business pursuits.

Bank clearings are another valuable pointer in the direction of improvement in business. The total April clearings for sixty-one cities were $4,232,322,999, a gain over March of 5.5 per cent., and over February of 25 per cent. Clearings for the week ended May 4 were $1,095,000,000, 10 per cent. more than for the previous week, and 15 per cent. more than for the first week in May, 1894. Clearings for the four months just past are $15,983,594,357, a gain of 9.1 per cent. over the same period in 1894. There is encouraging activity in the general jobbing trade, a steady flow of orders giving the forwarding departments plenty to do for the present at least. Reports from traveling salesmen, although varying in tone according to the locality whence they emanate, are satisfactory and encouraging, the orders sent forward indicating a steady expansion of business everywhere, although not so rapid in some quarters as in others. Each week shows some marked gain in one or another field, but it is to be expected that the approaching hot season will cause a general quiet to settle down upon all departments of trade. Another peculiar indication of a change in the industrial condition is the fact that industrial unrest no longer takes the form of strikes against a reduction of wages, but is now almost wholly for higher wages. This is an industrial straw showing the set of the changed tide. During the week which ended May 4 3,000 workers obtained higher wages without striking, making in all fully 80,000 industrial operatives who have had their wages advanced since the beginning of April. Altogether the outlook is excellent for a good fall trade.

Watermarks.

BY DANDY.

Whew! It's hot, and although this is the season of low shoes, the manufacturers say that they are going to be higher. Funny, isn't it?

He walked into an office and said: "Business is tip-top. I sold four car loads before I came to the office this morning." "Yes," remarked another salesman who was near by, "and then he woke up."

An exchange says of a man that he "is tried and trusted." Well, that's better than being trusted and then tried.

Up the State they had a bachelors' dinner, given to a member of the paper trade, a couple of weeks ago, and at the wind-up each "man jack" of the crowd emptied his glass and then sent it spinning to the ceiling. The carpet had to be taken up the next day, and the pieces of glass were picked out.

A concern in this city is now cremating the city refuse, which was formerly put on scows and sent to sea. This fact stirs up a stock man, who says: "I am told that 5,000 bales per week are packed in New York city alone from this refuse. That is 20,000 bales per month; 240,000 bales per year and in a hundred years 24,000,000 bales! Say 500 pounds per bale, and so 1,000 tons will be taken out of the market weekly. This will make rags scarce hereabouts. Therefore rags will be dearer. Paper mill men do not realize their peril!"

Paper makers are cautioned for their own welfare to chew over these chunks of wisdom, and before they get thoroughly rattled at the prospect presented they can place an order or two for their supply of rags.

However, it strikes me that if the supply of soda and sulphite fibre was suddenly shut off, it would cause the p. m. more sleepless nights than any scarcity in the supply of rags.

The paper stock man's statistics remind me of Edward Atkinson's figures. One day after having considered the matter in all of its aspects, Atkinson announced that 10,800,000,000 eggs were laid by hens annually in the United States. Nobody denied it, because no one had facilities or opportunities for interviewing all of the hens. Now, I am waiting for someone to tackle this stock man's figures.

An inventor makes a cannon of paper, and it is now in order for one of his followers, or perhaps himself, to make cannon balls of papers. Schoolboys bombard each other with spitballs, and children of an older growth might also do their fighting with paper, just as professional pugilists do.

Trade Talks.

Henry D. Oliver—I have come to New York in charge of the agency, for this city, of W. C. Hamilton & Sons, Philadelphia, and will look out for the finer trade in book papers, designed for high class books, editions de luxe, &c., in the various styles and finishes known to the trade. The slight improvement in business this spring gave promise of better things for the paper manufacturer, notwithstanding hard competition. Much of the trouble with paper manufacturers is overproduction. At present a limited demand for fine book papers seems to prevail, there being more call for the cheaper class of goods; or, in other words, editions de luxe are just now in abeyance. The Messrs. Hamilton's mills are running full time and turning out a full product.

Charles T. Askew, New York—Nearly every day I have people come in here who give me suggestions as to the way in which I should conduct my business, but if I followed all of the advice I receive I am afraid that I would be very much in the same position as the politician found himself in making a speech. He was a candidate for office and had prepared a speech to deliver to his constituents. He went to one place and delivered his speech and after the meeting was over a man came up, shook hands with him cordially, complimented him, said that he would vote for him, but thought that it would be better if he made no reference to the deal at Washington. The politician said that he would leave it out but at the next meeting in another locality another man after the meeting grasped his hand and said that he would certainly get his vote, but thought that his speech would be very much improved if he did not refer to a matter which hurt his feelings. He said that he would leave it out, and so the politician went on; but he soon found that if he took the advice of everyone and left out what each objected to he would not have any speech left. Now, if I had conducted my business in the way I have been advised, and had accepted all of the advice tendered, I should not to-day have any business. But to come down to business. It has increased with me this year over the months of last year, and although I did not expect that May would amount to much it has turned out very much better so far than I anticipated. I do not know whether this has been due to the paper which I handle, and which contains my own watermarks, but I do know that where they are once in they repeat themselves in continued orders. Speaking of the trade as a whole, I should say that business has revived gradually, with a good undertone, since last September. Orders are coming in naturally from all parts of the country which we represent. City business, too, has improved, but this may be due to the fact that we have new men on the trade. Our space is well crowded, and although it has been hard times and this business was started only three years ago, we have had to enlarge our store. We have ample orders to handle day by day, more in fact than we can; and to tell you the truth I have so much to do that when I get home I have to take a rest of some twenty minutes before I can do anything else, I am so exhausted. Business has been better since last September than at any time since I have been in business, and when it revived in September it was better at that time than for eighteen months previous. The hard times with us were last summer and last spring, that is, speaking about the trade generally, when we suffered from other evils also. I think that the prospects of a good season are excellent, and that with higher prices the panic will be a thing of the past, but with increased production I don't see any hopes of an advance in prices. Within the last three years the tendency has been to reduce prices, and I don't think that they will be revived if the mills continue to overproduce. Mills which have had a 62 inch machine have now a 96 inch machine—in other words some mills are getting out with the same labor, with improved machinery and with prices correspondingly low, 40 per cent. more paper than before. They are running at higher speed and have larger beating engines, and the smaller mills are compelled in order to produce paper at as low a price as their larger competitors, to put in machinery of greater capacity. The tendency is growing, for lots of mills have been making this change from small to larger machines for the past two years, and that has undoubtedly had much to do with bringing prices down. The only hope to-day for the Eastern manufacturer, and I mean the New England manufacturer by that, is to get some of the export trade, and the sooner we realize that the better it will be for the trade. We want the southern markets, say Mexico and the West Indies, that we may have an outlet for this increased production brought about by the tendencies mentioned. It must be remembered that a few years ago Chicago was the great dumping ground for the Eastern dealers, and whenever they had a surplus of 5,000 pounds of paper all they had to do was to go to Chicago and sell it. It is not so any longer. Great mills have sprung up in the West, which is now largely supplying the Western demand, and it must not be overlooked that the Western manufacturer is pressing the Eastern manufacturer mighty hard on paper. Now, we sell other things to southern countries and the East Indies. Why cannot we sell paper? One thing against it is the tariff, and what we want to open those markets for us is reciprocity. We export considerable quantities of paper already, but this could be much increased if reciprocal relations could be established between these countries and the United States along the lines laid down by Mr. Blaine. Another thing which the paper dealer must do in these days of competition to get business is to hustle for it. It is said that cherries grow in May, but business you must go out and get. You must make it grow.

Changes, Removals and New Firms.

The *Evening Reporter*, Petersburg, Va., is a new paper.

G. J. Bacon has opened a stationery store at Hinsdale, N. H.

The *Free Press*, Kinston, N. C., has resumed publication.

Topeka, Kan., has a new paper called the *Midland Sportsman*.

The *News*, Renovo, Pa., a weekly paper, has resumed publication.

Norris Powel will open a book and stationery store at Chester, Pa.

F. K. Griggs, Waterbury, Vt., has gone into the stationery business.

O. C. Smith has started in the wall paper business at Herkimer, N. Y.

F. A. Pelton, bookbinder, Appleton, Wis., has sold out to Augusta Hall.

The plant of the *World*, Dunkirk, Ind., will be removed to Celina, Ohio.

The *Democrat* Printing Company, Marion, Ohio, has been incorporated.

D. S. McCoy & Son have opened a wall paper store at Hagerstown, Md.

Forde & Emlyn have opened a book and stationery store at Columbia, S. C.

The *Free Press* and *Sentinel*, Trumansburg, N. Y., have been consolidated.

The *Star*, South Williamsport, Pa., is a new paper published by Chas. C. Tate.

The *News*, Brookline, Mass., has been purchased by Messrs. Paine & Holmes.

The *Daily Chronicle*, Florence, Col., is a new paper published by Vaughn & Neal.

P. M. Sloan & Co. have opened a wall paper and stationery store at Lock Haven, Pa.

The *Virginian*, Virginia, Minn., is a new paper, published in English and Swedish.

The *Industrial Union* and the *Enterprise*, Montrose, Cal., have been consolidated.

The *Post*, Zanesville, Ohio, has been sold to a company composed of Germans for $5,000.

Newell & Bellinger, booksellers, stationers, &c., Little Falls, N. Y., are closing out their business.

F. L. Hart & Co. have opened a wholesale paper, paper bag and twine store at Mankato, Minn.

The Englewood *Times* Printing Company, Englewood, N. J., has been incorporated with a capital stock of $6,000.

The *Lutheran World* Publishing Company, Cincinnati, Ohio, has reduced its capital stock from $50,000 to $20,000.

The *Volks-Zeitung* Company, Canton, Ohio, has been incorporated with an increase of capital from $5,000 to $10,000.

L. M. Izor has bought a half interest in the *Evening Argus*, Owosso, Mich., and will assume the management of the paper.

The Wadsworth Company, Laporte, Ind., has been incorporated with a capital stock

of $10,000 to carry on a book and stationery business.

John T. Warburton, printer, St. Joseph, Mo., has sold out.

F. S. Hunt, publisher, Sherbrook, N. Dak., has sold out.

A. E. Stratton & Co., publishers, Gardner, Mass., have sold out.

H. Musselman, publisher, Falls City, Neb., has leased his plant.

Mossman & Vollmer, publishers, Davenport, Ia., have been incorporated.

J. B. Heath, printer, Marion, Ind., has been succeeded by Heath & Wright.

J. W. Manker, stationer, Clay City, Ill., has been succeeded by Chas. Brissenden.

John B. Greenway, publisher, Holland, Mich., has removed to Grand Rapids, same State.

The Bradford Paint and Wall Paper Company, Bradford, Mass., has dissolved partnership.

Fielder & Mower, Atlanta, Ga., have engaged in the stationery and office supply business.

D. Chapin & Frost, booksellers, stationers, &c., Oneida, N. Y., have dissolved partnership.

D. A. Burgess, dealer in wall paper, &c., Allegan, Mich., has removed his business to Colorado.

Walter J. Shepard, proprietor of the Niagara Printing Company, Buffalo, N. Y., has sold out.

Wells & Chapman, publishers, Crete, Neb., have dissolved partnership. H. W. Wells continues.

The printing plant belonging to the estate of M. Miller, Victoria, B. C., has been sold to Simon Duck.

Templeton & Stockwell, publishers, Indianapolis, Ind., have been succeeded by Leroy Templeton.

Gilman & Frank, dealers in paper, paper bags, &c., New York, have been succeeded by Isaac Gilman.

S. H. Moore & Co., publishers, New York, have been succeeded by Stuart H. Moore, under the same style.

F. B. Festner has leased the job printing plant and pressroom of the Pokrok Zapadu Printing Company, Omaha, Neb.

The Western Paper Bag Company, Memphis, Tenn., has been succeeded by the Southern Bag and Paper Company.

The *Daily Star*, Aberdeen, S. Dak., is a new paper.

Crawfordsville, Ind., has a new paper called the *Herald*.

The *Daily News*, Homestead, Pa., has suspended publication.

The *Morning Star*, Pottstown, Pa., has suspended publication.

The *Impress*, San Francisco, Cal., has suspended publication.

The *Daily News*, Franklin, Ind., has suspended publication.

The *Herald*, Slayton, Minn., has been purchased by W. H. Dawson.

The *Herald*, Sparta, Mo., has suspended publication.

The *News*, Jewell, Kan., has suspended publication.

The *Times*, Fulda, Minn., has suspended publication.

The *Lance*, Portland, Ore., has suspended publication.

Scranton, Pa., has a new paper called *Life*.

Whitesville, N. Y., has a new paper called the *News*.

Woonsocket, R. I., has a new paper called the *Tribune*.

The *Echo*, Chicago, Ill, is a new fortnightly periodical.

Owensboro, Ky., has a new paper called the *Post*, edited by George Triplett.

The *Leader*, Monkton, Ont., is a new paper edited by H. T. Stevens.

G. Rau has removed from Room 113 on the sixth floor to Room 147 on the eighth floor of the *Times* Building, New York.

W. M. Beck has bought the business of the Art Wall Paper Company, Philadelphia, Pa. The style of the firm will be Wm. M. Beck & Co.

D. S. Packard & Co., manufacturers of leather board, Brockton, Mass., have sold out to V. Piloon, who will continue the business under the same style.

The *Advance* Company, Muscatine, Ia., has been incorporated by A. J. Allen, C. E. Allen and H. B. Allen to do a publishing and printing business. Capital stock, $5,000.

The Hanson Paper Milling Company, Kansas City, Mo., has been incorporated by E. C. Benedict, O. Shoubeck, Frank T. Wall and Hans Hanson. Capital stock, $30,000.

The S. P. Taylor Paper Company, San Francisco, Cal., has sold out to M. Brown & Sons. Will P. Taylor and James I. Taylor will remain with this house. It is stated that Edward M. Taylor and Frank L. Taylor will engage in business under the style of the old firm.

The Columbian Talc Company, of Gouverneur, St. Lawrence County, N. Y., has been incorporated to purchase and lease mineral lands, mining, milling, manufacturing and selling talc, soapstone and mineral pulp. Capital, $50,000; and directors, Wm. R. Candler, Chas. H. Little, Chas. T. Miller, of Detroit; Wm. T. Clark and John J. Wallace, of Hailesboro; Earl Bancroft, of Edwards, and Orrin J. David, of Gouverneur.

Clarence W. Scott and Carroll T. O'Meara have formed a copartnership as commission paper dealers, and will have their offices at Room 806 New York Life Building, Chicago, Ill.

The *Press-Post* Printing Company, Columbus, Ohio, has been incorporated by P. H. Bruck, Cotton H. Allen, Jas. Kilbourne, Dewitt C. Jones and Jas. Ross with a capital stock of $50,000.

The Sugar River Paper Mill Company, Claremont, N. H., has opened a New York office on the tenth floor of the *Times* Building, with J. R. Bowden, formerly of Perkins, Goodwin & Co., in charge.

The McGregor Printing Company, Canton, Ohio, has been incorporated by Archibald McGregor, John McGregor, Archie R. McGregor, Thos. S. Bolton and Reno Sprague, with a capital stock of $10,000.

The *Morning Journal*, New York, formerly owned by Albert Pulitzer, has been purchased by John R. McLean, the owner of the Cincinnati *Enquirer*, who will conduct it as a 2 cent daily. The price has not been given out, but is reported as $600,000.

The National Photo-Engraving Company, of New York, has been incorporated to deal in all kinds of stationery, books, engravings, &c. Capital, $10,000, and directors, Max Schweizer, of New York city; G. Frederick Kaklhoff, of Brooklyn, and Arthur Falk, of New York city.

The United American Printing and Publishing Company, Washington, D. C., has been incorporated to do a printing and publishing business. John G. Bushfield, president; J. H. Clarke, vice-president; W. J. Boyer, secretary; Woodbury Wheeton, treasurer, and J. W. Corey are the board of directors.

Market Review.

OFFICE OF THE PAPER TRADE JOURNAL, FRIDAY, May 10, 1895.

THE MONEY MARKET.—There was a very fair business in the stock market, and transactions showed a continued undercurrent of strength, the vast majority of active shares closing at higher figures. Business in call loans on stock collateral was light, and rates averaged 1½ per cent. Time loans are inactive, owing to the smallness of the demand from the stock market. Much pressure is being brought to bear upon the market through brokers, but it has resulted in the placing of little money. Quotations are 2 per cent. for thirty days, 2½ per cent. for sixty to ninety days, 3 per cent. for four and 3@3½ per cent. for five to six months on good Stock Exchange collateral. The supply of commercial paper is fair, but readily absorbed. Quotations are 3 per cent. for sixty to ninety day indorsed bills receivable, 3½@4 per cent. for four months' commission house names, 3¼@4 per cent. for prime four months, 4@4½ per cent. for prime six months and 5@6 per cent. for good single names having from four to six months to run. The money market was affected by the return to the banks of 40 per cent. of the money contributed by them to underwrite the subscription to the last Government loan. The market for both sterling and Continental bills was very weak on offerings of bills against securities for shipment abroad. The regular demand for remitters was insignificantly small. Posted rates were $4.88 for sixty days and $4.89½ for sight. Actual rates were $4.86½@4.87 for sixty days and $4.87½@4.88¼ for sight.

THE PAPER TRADE.—The News manufacturers continue their work on the formation of a combination and held several meetings, or rather a continued meeting covering several days, in this city this week. Progress is being made and committees have been appointed to make appraisals of mills, woodland, &c. It is said that at the present time the scheme is moving steadily forward, and that a successful outcome is one of the probabilities of the near future. The position of the market has not changed materially since last week. There is a fair business locally, but the market is not active. Prices have not undergone any change and as a rule are steady.

JUTE BUTTS.—The market is quiet. The statistical position as given in the May circular of Cabot, Ray & Co. is as follows: Imported into the United States, 1892, 232,387 bales; 1893, 331,738 bs.; 1894, 228,765 bs. Consumed in the United States, 1892, 222,609 bs.; 1893, 368,386 bs.; 1894, 234,915 bs. Stock, New York and Boston, January 1, 1895, none. Imported, New York and Boston, since January 1, 1895, 242,293 bs.; 1894, 95,705 bs.; 1893, 245,802 bs. Stock, May 1, 1895, New York and Boston, none; 1894, 4,392 bs.; 1893, 2,469 bs. On passage for the United States, April 23, 1895, and by cable to April 30, 1895, 124,718 bs.; 1894, 87,654 bs.; 1893, 105,758 bs. Visible supply to September 1, 1895, 124,718 bs.; 1894, 92,046 bs.; 1893, 130,449 bs. Consumption since January 1, 1895, 242,293 bs.; 1894, 97,463 bs.; 1893, 263,859 bs. Delivered to consumers past thirty days, 113,776 bs.; 1894, 24,870 bs.; 1893, 40,408 bs. The same circular says of the market: "Market for the month in Calcutta has been firmer; sales have been light owing to small supplies, the crop having been practically exhausted. It is also reported that crop prospects for coming season are bad. Market nominal at 1⅛ to 1 3-16c. for May-June shipments. Sailings for April, 11,000 bales. Deliveries to consumers for the month have been, to bagging manufacturers, 100,931 bales; to paper manufacturers, 12,845 bales. Spot stock, nil. Supply to September 1, paper quality, 42,856 bales; owned by bagging manufacturers, 81,862 bales."

WOOD PULP.—There continues to be a very steady call for Ground Wood, and manufacturers adhere to their views very closely, values ranging from $15 f. o. b. at pulp mill upward.

WOOD FIBRE.—There is a very fair call for Chemical Fibre. Domestic Bleached Soda is quoted at 2½@2¾c., as to quality. Domestic Sulphite is quoted at 1⅞@2⅜c., as to quality, for Unbleached, and 3½c. for Bleached. Foreign grades are quoted as follows: Unbleached Pine, soda process, 2.60@2.75c.; Bleached, same process, 3⅛@3.90c.; Unbleached, sulphite process, 1⅞@3.15c.; Bleached, do., 3½@4c.; Bleached Straw Pulp, 3.80c. This week there were imported at this port 37 tons of Chemical Fibre, being 19 tons from Antwerp, 4 tons from Hamburg, and 14 tons from Fiume.

FOREIGN RAGS AND PAPER STOCK.—The market for foreign rags is as a rule quiet. Some dealers have cleared out some store lots of considerable size, but as a rule transactions are light. Holders of Japanese Blues are now asking 1.30c., the market being stronger owing to spot lots being in store and there being none to arrive. This condition has stiffened the market for German Blues of good grade, and prices range a shade higher. Imports for the week aggregated 3,310 bales and 37 tons, being 868 bs. rags, 160 bs. papers, 37 tons chemical fibre and 2,282 bs. manillas. Ports of shipment and quantities are as follows: Antwerp, 19 tons chemical fibre, 245 bs. manillas; Bristol, 427 bs. manillas; Fiume, 14 tons chemical fibre; Hamburg, 723 bs. rags, 4 tons chemical fibre, 248 bs. manillas; Havre, 100 bs. manillas; Liverpool, 895 bs. manillas; London, 145 bs. rags, 160 bs. papers, 298 bs. manillas; Stettin, 69 bs. manillas.

DOMESTIC RAGS.—The market remains as it was last week, with prices ruling as then, say 3¼c. for Whites and 1.30c. for Thirds and Blues.

BAGGING, &c.—Gunny Bagging was quiet and remains quoted at 1.05c., with 50 tons sold to dealer at 1.02½c., with same figure offered for 200 ton lot by manufacturer and declined. Mixed Bagging is scarce and firm, ranging from 80@87½c. Spot is bare of Wool Tares and the quotation to arrive is 1.15c. Manilla imports for the week aggregated 2,282 bales, being 245 bs. from Antwerp, 427 bs. from Bristol, 248 bs. from Hamburg, 100 bs. from Havre, 895 bs. from Liverpool, 298 bs. from London and 69 bs. from Stettin.

OLD PAPERS.—There is a moderate all round call for Old Papers. We quote: No. 1 Hard White Shavings, 2½c.; No. 1 Soft White do., strictly free from wood, 2.05c.; Soft White do., ordinary, 1⅞@2c.; Old Ledgers, 1⅞c.; Solid Printed Books, 1¼c.; Mixed Shavings, No. 1, 1@1¼c.; Mixed Shavings, No. 2, ¾c.; Extra No. 1 Manillas, 90c.; No. 1 Manillas, ordinary, 75c.; No. 2 Manillas, 60c.; Light Book Stock, 60c.; Folded News (over issues), 50@55c.; Mixed Papers, 35c.; Commons, 25@30c.; Straw Clippings, 45c.; Binders' do., 45c.

STRAW.—Best grades are firm, with a moderate trade doing. We quote: Long Rye, at 55@65c.; Short Rye, at 45@50c.; Wheat, at 35@45c.; Oat, at 35@45c.

ROSINS.—The rosin market is without change. Low grades are in light supply and are firmly held. We quote: Common to Good Strained, $1.77½@1.80; E, $1.85@1.90; F, $1.90@1.95; G, $2; H, $2.20; I, $2.45; K, $2.70; M, $3; N, $3.15; W G, $3.20.

CHEMICALS.—There is very little change in the market for paper makers' chemicals. Under date of April 24 J. P. Brunner & Co. speak of the Liverpool market as follows: "Fresh orders for Soda Ash are not plentiful, notwithstanding the low values. The nearest spot range for tierces is about: Leblanc Ash, 48 per cent., £3 10s. to £3 15s. per ton; 58 per cent., £3 15s. to £4 per ton, net. Ammonia Ash, 48 per cent., £3 to £3 5s. per ton; 58 per cent., £3 5s. to £3 10s. per ton, cash. Bags 5s. per ton less. Soda Crystals are a shade lower, at £2 3s. 9d. to £2 5s. per ton, less 5 per cent. for barrels, and quiet thereat. Caustic Soda is in poor demand for the season of the year, and prices show a slightly easier tendency. We quote spot range: 60 per cent., £6 7s. 6d. to £6 10s. per ton; 70 per cent., £7 7s. 6d. to £7 10s. per ton, net cash; 74 per cent., £8 7s. 6d. to £8 10s. per ton; 76 per cent., £9 5s. to £9 10s. per ton, net cash. Bleaching Powder is only in moderate request, while at the same time there is not much offering in the way of outside makes. On the spot, £7 to £7 5s. per ton, net cash, is about range for hardwood packages, according to export market." Bleaching Powder remains firm and in light supply on spot. Caustic Soda is steady and in moderate movement, and Alkali is firm. During the week there have been sales of Bleach at 1.85 @1.95c.; 10 tons Soda Ash at 1⅛c.; Caustic Soda, 2.10c., and Alkali, 1¼c.

CHINA CLAY.—Spot lots are in fairly active demand at the range $11@16.50 per ton, as to grade and quantity.

TWINES.—Stock is moving in a very fair way. We quote: Sisal Hay Rope, 5@6c.; Sisal Lath Yarn, fine, 9¼c., and medium, 9c.; Jute Lines, 7½c.; Jute Ready, 7@7½c.; New Zealand Hay Rope, 6¼@7¼c.; New Zealand Lath Yarn, fine, 9¼c.; medium, 8¼c. Twines—Hemp, 4½ and 6 B Russia, 12c.; 4½ and 6 A American, 12c.; 4½ and 6 D Jute, 9½c.; 4½ and 6 L Jute, 9c.; Hemp Ball, 18 B C, 17c.; 18 C, 15c.; Russian Hemp Hay Rope, 9c.

COAL.—The market is unchanged, and there continues to be trouble among the Anthracite men.

EDWIN BUTTERWORTH & CO.
MANCHESTER ENGLAND,
PACKERS OF ALL KINDS OF
Paper Stock, Cotton Waste and Buffalo Sizing
Wood Pulp, Moist and Air Dry Pulp,
Soda and Ground Pulp,
83 GUNNY BAGGING, &c.
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Vanderbilt Building, No. 132 Nassau Street,
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WATERBURY
Felts and Jackets,
MANUFACTURED BY
H. WATERBURY & SONS CO.,
ORISKANY, N. Y.
Adapted to *every* grade of paper, from the *finest* to the *coarsest*.
The Largest Manufacturers of Paper Makers' Felts in the World.
Our wet machine or pulp felts are *unequaled* for *durability*.
For WRITING and LEDGER PAPERS We warrant a felt equal to anything imported.

PRICES CURRENT.

NEW YORK MARKET.

Paper Market.

DEALERS' SELLING PRICES.

Ledger and Record	$0.16	@	$0.21
Flat Caps, superfines	11½	@	14
Flat Caps, fines	11	@	13
Flat Caps, engine sized	7	@	9
Blotting, American	8	@	12
Blotting, English	17	@	....
Book, super sized and calendered	5	@	8
Book, super sized and tinted	5	@	8
Book, extra machine finish	5	@	....
Book, machine finish, low grade	4½	@	5
News	2¾	@	3
Poster	3	@	....
Hanging, superfine, No. 1	8	@	10
Hanging, superfine, No. 2	6	@	8
Hanging, machine satin	4	@	4½
Hanging, white blank, No. 1	4	@	4½
Hanging, curtain	3¾	@	4
Hanging, brown	2½	@	3
Colored papers, double mediums	6½	@	8
Colored papers, glazed medium	7½	@	8½
Colored papers, tobacco	8½	@	9½
Colored papers, tissues, 20×30, ℔ ream	1.10	@	1.35
Tissues, black, 20×30, ℔ ream	1.40	@	1.50
White tissue, 20×30, ℔ ream	60	@	80
Manillas, Flour sack, cream	10½	@	....
Manillas, Flour sack, drab	9½	@	11
Manillas, Rope, unbleached No. 1	9½	@	11
Manillas, Rope, unbleached No. 2	7½	@	9
Manillas, No. 1, light weight	6¼	@	6¾
Manillas, No. 1, heavy weight	6¼	@	6½
Manillas, No. 2	5	@	6
Manillas, Bogus	3½	@	3½
Wrapping Parchment	18	@	....
Tissue Manillas, full count, weight and size, 24×36, other sizes in proportion	55	@	60
Hardware, light colored, No. 1	9	@	10
Hardware, No. 1, glazed, tarred	7	@	8
Hardware, No. 1, glazed	4½	@	5
Binders' Boards, ℔ ton, No. 1	70.00	@	90.00
Binders' Boards, ℔ ton, No. 2	30.00	@	40.00
Strawboards, air dried, No. 1, ℔ ton	47.50	@	....
Strawboards, steam dried, No. 1, ℔ ton f. o. b. mill	½	@	34.00
Straw Wrapping, basis, 13×20, 15½ lbs., 20 sheets—			
36×40, from 38 to 42 lbs. ℔ rm	65	@	....
30×40, from 30 to 34 lbs. ℔ rm	....	@	52
24×36, from 24 to 26 lbs. ℔ rm	....	@	48
22×32, from 24 to 26 lbs. ℔ rm	45	@	....
20×30, 21 lbs., ℔ rm	....	@	34
20×30, from 14 to 17 lbs. ℔ rm	26	@	....
16×22, from 12 to 13 lbs. ℔ rm	25	@	....
18×28	....	@	24
15×20, 10 lbs. ℔ rm	....	@	17
15×20, from 7 to 8½ lbs. ℔ rm	....	@	13
14×18	....	@	12
12×16	....	@	11
11×15	....	@	10
Straw Wrapping, ℔ lb., heavy weight	1.75	@	1.85
Straw Wrapping, ℔ lb., light weight	1¾	@	....
Cigarette, Straw Tissue, per case of 100 boxes, 50 books to the box, 200 sheets to the book	21.00	@	30.00
Tea Papers, 16 sheet quires—			
12x18	....	@	14
14x20	....	@	18
Card Middles, ground wood	5¼	@	6¾
Card Middles, long fibre wood	8½	@	9
Card Middles, rag and wood	6	@	9
Pulp Lined Boards, single manilla, No. 100 and heavier	42.50	@	....
Pulp Lined Boards, double manilla, No. 100 and heavier	47.50	@	....

Rags, Rope and Bagging.

White Shirt Cuttings, No. 1	4¼	@	....
Mill Assorted Whites	3½	@	3¾
Unbleached Muslins	4⅜	@	4½
City Whites, No. 1	3	@	3¼
New Seconds, light	2¼	@	....
New Seconds, dark	1¾	@	2
No. 2 Whites	¾	@	1.15
Cotton Canvas, No. 1	3	@	....
Linen Canvas, No. 1	....	@	2½
Country Mixed, free of Woolens	60	@	....
Seconds (City)	....	@	....
Colors, ℔ 100 lbs	....	@	....
Manilla Rope	....	@	2½
Manilla Rope, tarred	....	@	....
Gunny Bagging, No. 1	1.10	@	1.20
Mixed Bagging, No. 1	¾	@	1
Burlap Bagging, No. 1	1.10	@	1.15
Kentucky Hemp Bagging	....	@	....
Tar Shakings	1	@	....
Hemp Twine Stock	....	@	....
Jute Waste	¾	@	1¼

English Old Papers and Shavings.

Hard Shavings, No. 1	2	@	....
Soft Shavings, No. 1	2½	@	2⅝
White and Colored Shavings, No. 1	1¾	@	1⅞
White and Colored Shavings, No. 2	1	@	1¼
Cream Post Shavings	2½	@	....
Paper Collar Cuttings	....	@	2
Briefs and Letters	1½	@	1¾
Books and Pamphlets	1.10	@	....
Old Newspapers	....	@	....
Broken News and Letters	¾	@	1
Old Blank Books	2¼	@	2½
White and Buff Railway Sheets	1¾	@	....

Hamburg Rags, &c.

N S C, New Shirt Cuttings	....	@	4¼
S P F F F, No. 1 Linens	....	@	3½
S P F F, No. 2 Linens	....	@	3¼
S P F, No. 3 Linens	....	@	2
F G, No. 4 Linens	....	@	2
F F, No. 5 Linens	1¾	@	....
Extra Fine Blue Linen, light color	2	@	....
L F B, Blue Linens	2¼	@	....
C S P F F F, No 1 Cottons	....	@	3½
C S P F F, No. 2 Cottons	....	@	....
C S P F, No. 3 Cottons	2½	@	....
C C C, Colored Cottons	....	@	....
C F X, Low grade Cottons	⅝	@	⅞
Extra Fine Blue Cottons	....	@	1½

Pulps and Fibres.

Ground Wood, domestic, delivered	1	@	1.35
Ground Wood, foreign, ex dock	....	@	....
Soda Fibre, domestic, unbleached	....	@	....
Soda Fibre, domestic, bleached	3	@	3¼
Soda Fibre, foreign, unbleached	2.65	@	3
Soda Fibre, foreign, bleached	3½	@	....
Sulphite, domestic, unbleached	2.60	@	3
Sulphite, domestic, bleached	3½	@	3¾
Sulphite, foreign, unbleached	3	@	3½
Sulphite, foreign, bleached	4	@	4⅛

Japanese Rags.

Blues, Hiogo, ex store	1.22½	@	....

Chemicals, Coloring Materials, &c.

Alkali, 58 ℔ cent	1	@	1.30
Alum, lump	1.65	@	....
Alum, ground	1.75	@	....
Alum, Keystone	1¾	@	⅛
Alum, Diamond	....	@	2¼
Alum, pearl	2¾	@	2¾
Alum, porous	2¾	@	2¾
Alum, Merrimac porous	2	@	....
Aluminous Cake	....	@	1¾
Anti-Chlorine	....	@	2¼
Bichromate Potash, American	....	@	10
Bleaching Powders, spot	1.85	@	1.95
Cambridge Ochre	11.25	@	....
Caustic Soda, 60 ℔ cent	2.30	@	2.30
Clay, China, English, ℔ ton	12.50	@	17.00
Clay, China, "Star"	12.50	@	....
Clay, China, "Keystone"	10.75	@	....
Clay, South Carolina, ℔ ton	9.50	@	10.00
Clay, Terra Alba, French, ℔ cwt	1.00	@	1.12½
Clay, Terra Alba, American, No. 1	95	@	1.00
Corn Starch	3	@	3½
Copperas, American	....	@	80
Extract Logwood	9½	@	....
Mineral Pulp	10.25	@	....
Orange Mineral	....	@	9½
Potato Starch	4½	@	4¾
Prussian Blue, dry	20	@	25
Prussiate Potash, American	....	@	24½
Rosins, common to good strained, ℔ bbl	1.77½	@	1.80
Rosins, E, ℔ bbl	1.85	@	1.90
Rosins, F, ℔ bbl	1.90	@	1.95
Rosins, G, ℔ bbl	2.00	@	....
Rosins, H, ℔ bbl	2.20	@	....
Rosins, I, ℔ bbl	2.45	@	....
Rosins, K, ℔ bbl	....	@	2.70
Rosins, M, ℔ bbl	....	@	3.00
Rosins, N, ℔ bbl	....	@	3.15
Rosins, W G, ℔ bbl	3.20	@	....
Sal Soda	1.10	@	....
Soda Ash Caustic, 48 ℔ cent	1.60	@	1.65
Soda Ash, carbonated, 48 ℔ cent	1.37½	@	1.70
Soluble Blue	40	@	55
Spanish Brown	½	@	1
Sugar Lead, white	12	@	....
Sugar Lead, brown	7	@	....
Sulphate of Alumina	....	@	2¼
Sulphuric Acid, 66 ℔ cent	1	@	1¼
Ultramarine, blue	14	@	17½
Venetian Red	1	@	1½
Vitriol, blue	5½	@	5¾
Yellow Ochre Rochelle	1.35	@	1.50

BOSTON MARKET.

Paper Stock.

White Rags, No. 1	3½	@	4
No. 2 Whites	2½	@	2¾
Common Seconds	1½	@	2
Thirds and Blues	1¼	@	....
Southern Mixed Rags	80	@	90
Colors, country	½	@	¾
Colors, city	25	@	30
New Calicoes, light	2	@	2½
New Calicoes, dark	1¾	@	1¾
Shirt Cuttings, best	4	@	4½
Shirt Cuttings, good	3¾	@	3¾
Shirt Cuttings, unbleached	3½	@	3¾
Shirt Cuttings, unbleached No. 2	3	@	3½
Shirt Cuttings, cheviots	2¾	@	2¾
Overall Cuttings, blue	2¼	@	2½
Overall Cuttings, brown	2	@	2⅛
Shoe Rags, bleached	3¾	@	3⅞
Shoe Rags, unbleached	3¼	@	3½
Shoe Rags, brown	2¾	@	2⅞
Cotton Flannels, bleached	3	@	....
Cotton Flannels, unbleached	3½	@	3⅝
Corset Rags, drab	3½	@	3⅝
Corset Rags, white	4	@	4⅛
Tailors' Seconds	1¾	@	1⅞
Tailors' Colors	25	@	30
Cotton Canvas	2¼	@	2½
Cotton Canvas, No. 2	1¾	@	1¾
Linen Canvas	1¾	@	2
New Canvas Cutting	3½	@	3½
Insole Canvas	3	@	3½
Print Papers, best	30	@	35
Folded News	35	@	40
Old Waste Papers	25	@	30
Manilla Paper, No. 1	1.15	@	1.20
Manilla Paper, good mixed	80	@	95
Manilla Paper, blues	65	@	70
Mixed Book Stock	95	@	1.00
Books and Pamphlets	1.10	@	1.15
Book Stock, light	70	@	75
Ledgers and Letters	1.85	@	1.90
Soft Book Shavings	1½	@	2
Hard White Book Shavings	2½	@	2¾
Leather Board Chips	75	@	80
Straw Chips	35	@	40
Shivey Bagging	1¾	@	1½
No. 1 Factory Bagging	1.00	@	1.10
Burlap Bagging	1.00	@	1.10
Burlap Bagging, large pieces	1½	@	2
Kentucky Bagging	1	@	1¼
Mixed Bagging	½	@	¾
No. 2 Bagging	½	@	⅝
Shakings, soft	½	@	⅝
Tarred Shakings	1	@	1¼
Standing Rigging	2¼	@	2½
Standing Rigging, foreign	2¼	@	2¼
Bolt Rope	2	@	2.05
Oakum Junk, No. 2	1¾	@	1¾
Tarred Paper Junk	1.15	@	1.20
Tarred Paper Junk, inferior	¾	@	⅞
Manilla Rope	1¾	@	2
Tarred Manilla	1¾	@	1¾
Hemp Strings	1	@	1¼
Sisal Strings	1.15	@	1.20
Wool Strings	1.10	@	1.15
Flax Tow	¾	@	1
Flax Waste	¾	@	1

Wants and For Sale.

Twenty-five words or less, one dollar each insertion. Over twenty-five words, four cents a word each insertion, up to eighty words. Cash should accompany order.

Over eighty words, or displayed advertising, will be charged for by the inch, according to our regular schedule of rates.

Answers can come in our care and will be promptly forwarded without extra charge.

WANTED—SITUATION AS ASSISTANT foreman or boss machine tender; sober, steady; thirty-two years old; would like to correspond with reliable parties; best of references. BOOKER, care Journal.

SITUATION WANTED—AS BOSS MACHINE tender; accustomed to large machines and high speed; best of references as to character and ability. Address M. M., care of Journal.

WANTED—MACHINE TENDER, 88 INCH Fourdrinier Pusey & Jones machine, on book papers; married; strictly sober; references. Address YORKE, care of Paper Trade Journal.

WANTED—TO COMMUNICATE WITH A competent color man who understands mixing colors for coloring paper; state length of experience. Answer N. H. C., care of Paper Trade Journal.

POSITION WANTED—BY EXPERIENCED young man as superintendent or manager mill making bag manilla, rope or flour sack, copying or tissue; good references. COMPETENT, care Journal.

WANTED—SITUATION AS FOREMAN FOR coating paper mill, by a man who is fully competent and thoroughly understands the business, and who also has a very fine idea for double coating works; has had twenty years' experience; best references. COATING, care of Journal.

SITUATION WANTED—BY A THOROUGHLY competent young man, to take charge of finishing in book, manilla or news mill; references. Address S. E. N., care of Journal.

WANTED—POSITION AS SUPERINTENDent in manilla mill, by man who thoroughly understands manillas; had good experience in constructing and starting new mills; will be open for engagement about August 1; all correspondence strictly confidential. Address M. S. H., care Paper Trade Journal.

DRAUGHTSMAN WANTED—A FIRST-class draughtsman familiar with paper machinery work; references required. Address DRAUGHTSMAN, care of this office.

SITUATION WANTED,

By young married man, as boss in color department; understands mixing colors for fine colored, white, plated and chromo papers, enameled and glazed, ivories and satins for lithograph, bristols, boxboards and wedding cards; can give good references. Apply to COLOR MIXER,
Box 818, Holyoke, Mass.

FOR SALE—A HOLLAND BEATING ENGINE with roll 48x48 inches; new bars; only been in use a few months; for sale cheap. Address B., Paper Trade Journal.

FOR SALE.

One Diaphragm Screen for six plates, 12x40.
Two Cylinder Molds, 36x90 in.
Two rubber covered Bottom Press Rolls, 16x88 in.
Two rubber Couch Rolls, 15x90 in.
All entirely new.

BLACK & CLAWSON CO.,
Hamilton, Ohio.

PAPER MILL
For Sale or To Let.

Good water power and location; also large building and power for any manufacturing. Apply to
W. K. DANA,
Westbrook, Me.

FOR SALE.

One second-hand 22x48 Wheelock Engine, latest valve pattern, only used short time and taken out to make room for larger engine; also one Deane Vacuum Condenser for above engine; either or both will be sold cheap.
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Mittineague, Mass.

FOR SALE.

One Emerson and one Smith & Winchester Jordan Engine, in good condition; taken out to make room for Marshall perfecting engines.
CROCKER MFG. CO.,
Holyoke, Mass.

FOR SALE.

Two second-hand Jordans.
One Marshall Engine.
Two Rotaries, 6 × 29 ft.
Two Daniels Rag Cutters.
Two Revolving Paper Cutters.
All guaranteed in good condition; nearly new.
NOBLE & FOSS MACHINE CO.,
Hoosick Falls, N. Y.

PAPER MILL
For Sale or Rent.

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JOHN A. DUSHANE,
44 South Charles Street, Baltimore, Md.

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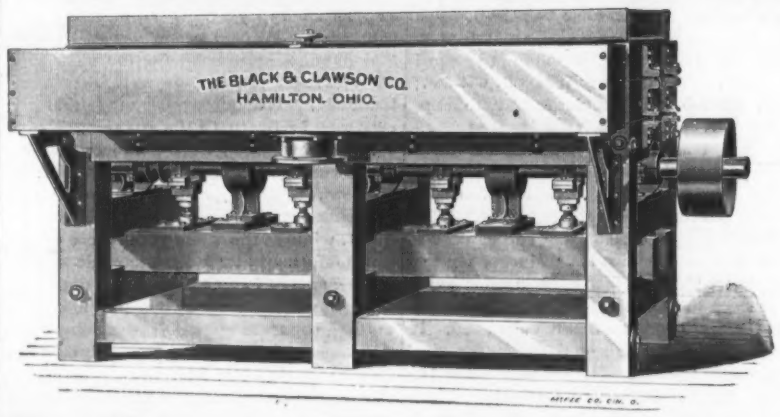

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NOTICE.

My attention having been called to the fact that certain parties are infringing certain Letters Patent granted to me, to wit: No. 212,866, dated March 4, 1879, covering a new form of carpet lining, and No. 235,698, dated December 21, 1880, covering the method of and apparatus for making the same, this is to notify all such persons, whether manufacturers or dealers, that any infringement of either of said patents will be prosecuted to the full extent of the law. MOSES NEWTON, Patentee.

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One 82 inch Fourdrinier machine complete, with press rolls; nine 36x78 inch dryers; stock of chilled rolls; reel, cone pulley cutter; Marshall driving train; made in 1887 and used three years.
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Two new Jones double lighter beating and washing engines; iron rolls 52 inch face.
One 74 inch double cylinder machine, consisting of screens, two molds, 30x74 inches; first and second presses; wood and iron rolls; fifteen iron dryers, 36x72 inches; stack of nine chilled rolls, revolving reel, slitter and winder, with Marshall driving train.
One 56 inch double cylinder machine, consisting of knocker screen, two molds, 30x56 inches; good, sound vat; first and second presses; three iron and one wood roll, 12x35 inches; nine iron dryers, 26x54 inches, with heavy frames, siphon packing boxes and patent exhaust; one stack of five chilled rolls, two 12, three 7x54 inch face; one cone pulley cutter, with 54 inch knife; upright reel; in excellent condition.
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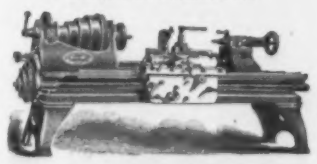

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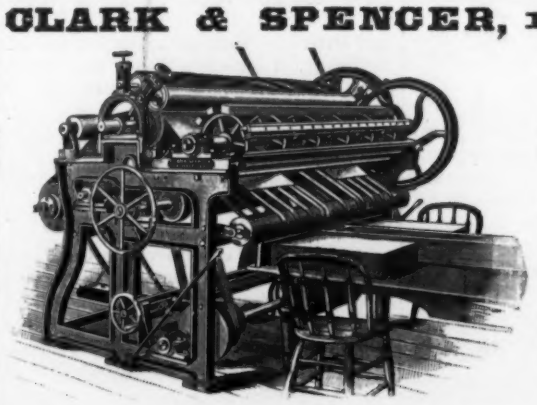

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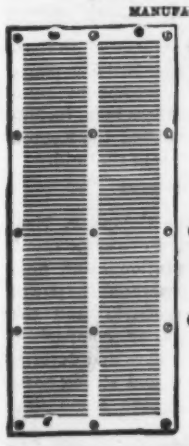

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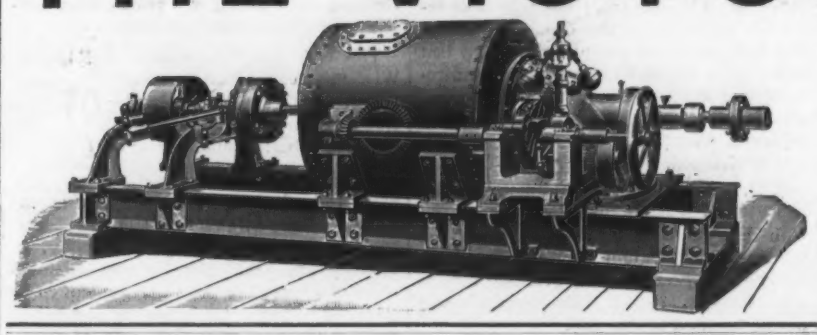

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17½ inch	17.96	36.35	.8930
20 inch	18.21	49.00	.8532
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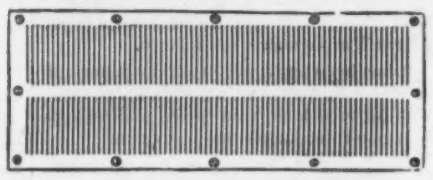

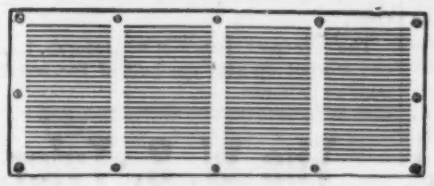

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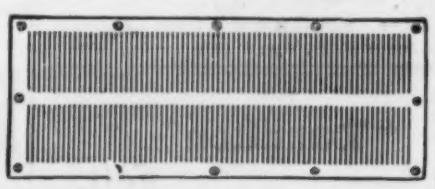

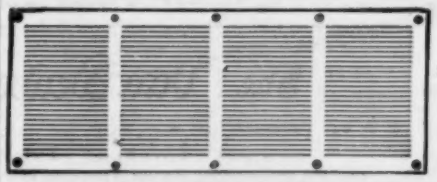

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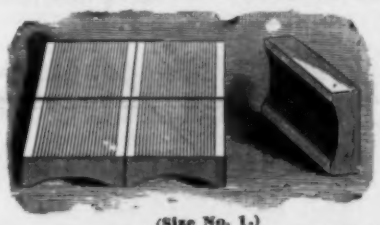

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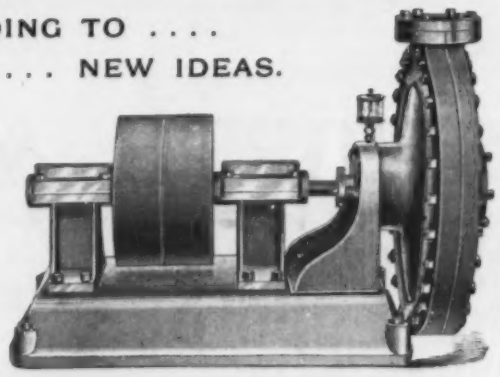

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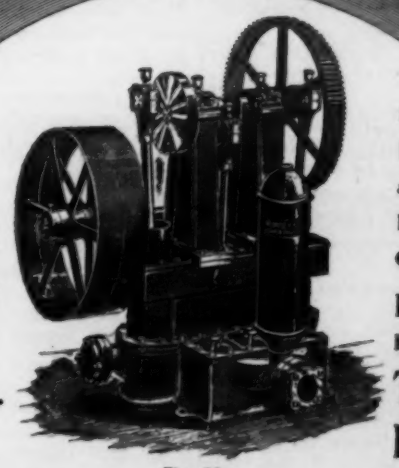

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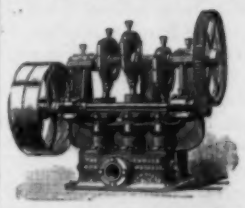

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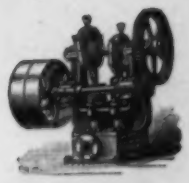

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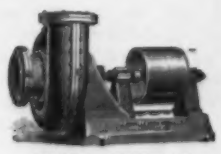

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LOWVILLE, N. Y.

Manufacturing News.

EASTERN STATES.

The annual meetings of the directors of the Piscataquis Falls Pulp and Paper Company, Enfield, Me., and the Penobscot Chemical Fibre Company, Great Works, Me., were held at the office of the pulp mill at Great Works recently. The officers chosen for the ensuing year for the Piscataquis Falls Pulp and Paper Company are: Directors, Samuel L. Montague, Arthur W. Clapp, Gerard C. Toby, Chas. H. Montague, Chas. E. Haskins, Geo. W. Wadsworth, Chas. Q. Terrill, Horatio J. Gilbert, Boston; James B. Mullen, Old Town; president, Samuel L. Montague; treasurer, Arthur W. Clapp; clerk, Chas. W. Mullen. The same director and officers were elected for the Penobscot Chemical Fibre Company, with the exception of clerk, James B. Mullen being chosen clerk for that company.

The George R. Dickinson Paper Company, Holyoke, Mass., will put up a large addition to its mill. Six new rag engines and two new rotary bleach boilers will be put in and a 54 inch wheel will be added to the motor plant. The increased capacity of the mill will be about 5 tons.

Vickery & Hill, publishers, Augusta, Me., will build an addition to their plant 25x50 feet and three stories high.

Extensive repairs are being made in the plant of the Penobscot Chemical Fibre Company, at Great Works, Me.

Robertson Brothers, Hinsdale, N. H., are putting in a new steam engine and new boiler, so that there may be no curtailment in their production in the event of short water power. They are running full time on orders.

Geo. A. Robertson & Co., Hinsdale, N. H., are to put in new stuff chests and are busy on orders.

MIDDLE STATES.

The new pulp mill at Freydenburgh Falls, N. Y., is about ready to start up, and will turn out about 60 tons a day. The dam is 550 feet long; the wing, 285 feet long. In the construction of the mill, which is 47x200 feet, 2,500,000 feet of lumber were used.

Contracts have been let and ground broken for the Westinghouse Machine Company's new shops at East Pittsburg, Pa. A few years ago the Westinghouse Air Brake Company erected large shops at a point on the main line of the Pennsylvania Railroad, about 12 miles from Union Station, Pittsburg, where the town of Wilmerding was laid out and built. The location at East Pittsburg of the Westinghouse Electric and Manufacturing Company's immense plant and the Fuel Gas and Manufacturing Company's factory, to be followed now by the removal of the Westinghouse Machine Company to the same place, will form, with the Union Switch and Signal Company's works at Swissvale, a concentration of Westinghouse interests practically at one point, within half an hour's ride of the city. The main building of the Westinghouse Machine Company's new shops will be 602x230 feet. The construction throughout will be as nearly fireproof as modern building methods can devise. To meet this proposition, the specifications call for a steel structure with brick walls, slate roofs, wire glass skylights, &c. A building of similar construction, 200x60 feet, will contain the hammer shop and power plant. Within the main building, through which switches are run direct from the main line of the Pennsylvania Railroad, will be the machine shop, erecting shop, foundry, pattern shop, warehouse, offices, &c. Two crane runways, each 60 feet span, on which electric cranes of the latest improved design will be used, extend the length of the building. The remaining space is taken up with galleries, provided with lighter crane service. The present equipment of machine tools will be increased by the addition of whatever is best to facilitate the manufacture and handling of the company's enormous product. The hammer shop will have every convenience that the best shop practice can suggest for doing work thoroughly and expeditiously. It will be equipped with one 8 ton, one 3 ton, one 2 ton and several smaller hammers, besides the usual cranes, &c. It is estimated that the cost of the buildings alone will reach $400,000. The contracts call for completion by November 1, 1895. The contracts have been given out as follows: Stone work, Fred. Gwinner, Pittsburg, Pa.; brick work, Steele & Hall, Pittsburg, Pa.; carpenter work, George Hogg, Pittsburg, Pa.; structural steel, Keystone Bridge Works, Pittsburg, Pa.; galvanized iron and skylights, T. W. Irwin, Allegheny, Pa.; slating, Aiken & Co., Pittsburg, Pa.; painting, Cluley & Sons, Pittsburg, Pa.; plumbing, McFadden & Craig, Pittsburg, Pa.

The plant of the Utica Paper Box Company, Utica, N. Y., is to be enlarged. A new story will be added and sufficient machinery put in to manufacture 15,000 boxes daily. The latest improved machinery will be used from the Amsterdam Paper Box Machinery Company.

Negotiations are pending for the establishment of a large paper mill at Auburn, N. Y.

Frank Kichline, of Easton, Pa., is preparing to start a paper box factory in that city.

The Niagara Paper Company, Lockport, N. Y., has received an order from Liverpool, England, for ten cases of its new product, sponge crepon.

It is said that a novelty paper factory is to be established at Roxbury, N. Y.

It is rumored that the Empire Mills, Chatham, N. Y., are to be sold.

There were some big runs at the Niagara Falls Paper Mills, Niagara Falls, N. Y., last week, if the figures from the machine tenders are to be credited. The 136 inch Fourdrinier is reported to have helped to put the record up to 166,000 pounds in one day.

It is announced that the Traders Paper Company, Lockport, N. Y., will put in a cylinder machine and make manilla board and wrapping paper.

The J. & J. Rogers Chemical Pulp Mill and dam on the west branch of the Ausable River, near Ausable Forks, N. Y., withstood the pressure of exceptionally high water and ice this spring without damage, which shows that the works are staunch in every respect.

On June 1 Dill & Collins will take possession of the paper mills of Alex. Balfour & Sons, Philadelphia, Pa., which they have bought for $500,000.

An attachment for $5,461 has been obtained against the High Falls Sulphite Pulp and Mining Company, Canton, N. Y., in favor of Clark & Thompson, for alleged breach of contract for the purchase of spruce and balsam timber.

The Pratt, Gould & Haberer Manufacturing Company is about to begin its wood pulp and paper mill at Lyons Falls, N. Y., which it intends to make one of the finest of its kind in the northern part of the State. The plant will utilize the full flow of the Black and Moose rivers.

The Goulds Manufacturing Company, Seneca Falls, N. Y., is very busy on triplex pumps at the present time; in fact, it shipped from its warehouse during the week ended May 4 the largest tonnage which has ever been shipped in one week from its works. It reports the following sales: To the Solvay Process Company, Syracuse, N. Y., one 12x12 inch triplex power pump, with steel ball valves, which is to be used for pumping waste; New Orleans Railway and Supply Company, New Orleans, La., two 5x8 inch triplex power pumps; both of these pumps are to be operated by an electric motor, one pump being geared to each end of the armature shaft, the pump and motor being mounted on one bed plate; Freydenburgh Falls Pump Company, Plattsburgh, N. Y., one 10x12 inch triplex power pump; Michigan Alkali Company, Wyandotte, Mich., three 6¼x8 inch triplex power pumps; Manion & Co., New Orleans, La., two 5x6 inch triplex power pumps; Robinson & Cary, St. Paul, Minn., one 4x4 inch triplex power pump.

The Dansville Pulp and Paper Mill, Dansville, N. Y., is about to add new machinery for the manufacture of book paper, and will shut down while improvements are being made, starting up again about June 1.

The new machine shop for the Goulds Manufacturing Company, at Seneca Falls, N. Y., will be designed and built by the Berlin Iron Bridge Company, East Berlin, Conn. The building, as designed, will be constructed with a steel frame and a 15 ton traveling crane.

The Eureka Paper Company, Fulton, N. Y., in order to avoid all inconvenience from burning shavings and cinders has put a large cinder arrester on the smokestack at its mill.

The Dove Mill, Modena, Pa., will be lighted with electricity. A Philadelphia firm has the contract.

The Roaring Spring Mill, Roaring Spring, Pa., is to have extensive additions the coming summer.

WESTERN STATES.

The case of the State against Max H. Lowenstein, proprietor of the Stratford Paper Mills, Delaware, Ohio, who was indicted for polluting the Olentangy River, was brought to an abrupt termination last week. His counsel objected to the introduction of evidence under the indictment, which was claimed to be defective. The objection was sustained and Lowenstein was discharged.

C. W. Howard, who is building a pulp and paper mill at Park Falls, Wis., in company with Henry Sherry and Frank Leavens, has purchased an Indian dam on Flambeau River and expects to begin grinding pulp in a few days, but says that the paper mill will not be finished before fall.

R. S. Fram, Vandalia, Ill., has under consideration the prospect of building a paper mill at Murphysboro, same State.

It has been announced that the paper mill of Walsh Brothers at Cuyahoga Falls, Ohio, will be rebuilt at that place, and will be over one-third larger than the old mill.

The Board of Trade of St. Joseph, Mich., has closed a deal with James and J. W. Mullen whereby the latter are to establish a paper mill at St. Joseph. They will erect a building 200x60 feet, most of it two stories in height.

The Diamond Paper Company, Anderson, Ohio, started its new plant on May 6. The entire plant has been worked over and the capacity has been almost doubled by the addition of new buildings and the latest improved machinery.

The Falls Manufacturing Company, Oconto Falls, Wis., had a big run with its 110 inch machine during the week ending April 28, averaging a daily output of 200,117 pounds, or over 100 tons for the week. Heretofore 15 tons per day has been considered a big run for its machines.

The Nekoosa Paper Company, Nekoosa, Wis., has commenced excavating preparatory to laying the foundation for a new machine room which is to be built at once. It will also build a machine shop.

The Globe Tissue Paper Company, Elkhart, Ind., has brought an action in the United States Circuit Court of that State, against the Crystal Paper Company, of Middletown, Ohio, for alleged infringement of a patent on an improvement to be attached to paper machines for converting unfinished tissue paper into wax or waterproof paper by spreading wax or paraffine on it. Damages and injunctions are asked for.

The Wisconsin River Paper Company, Stevens Point, Wis., has just put in an immense water wheel, which connects with the wood room, and gives 465 additional horse power to this department. It is a 62 inch Leffel wheel, made at Springfield, Ohio.

The Freeport Paper Mill, Decorah, Ia., has started up with one-half of the usual number of hands.

SOUTHERN STATES.

A wood pulp mill is under construction at Marlinton, Pocahontas County, W. Va.

It is proposed to build a paper mill at Meridian, Miss.

The plan is almost consummated to reorganize the old Dupont Paper Mill Company, of Louisville, Ky. The new company, composed of well-known business men, including the Duponts, will be called the Kenton Paper Company, and will refit the mill.

The Babcock & Wilcox Company, New York, has issued "High Pressure Steam," giving views of shell, sectional and non-sectional boilers which generated the power at the Centennial Exposition and the World's Fair, and shows by comparison with views of its own boilers and descriptions of what are the weak and strong parts in a boiler. Issued by the same firm is "Facts," the nature of which is stated in the opening headline, "Things to avoid in buying boilers." "In buying a boiler," it says, "it is just as necessary to know what won't do as what will do." The succeeding pages point out the way, and the two books will together convey information which is of decided value to all steam users.

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Failures.

Armstrong & Co., dealers in wall paper, Portland, Ore., have made an assignment.

W. N. Gunderson, manufacturer of order books, Chicago, Ill., has made an assignment.

Peter F. Behe, paper dealer, Philadelphia, Pa., has made an assigment to Joseph F. Hagen.

O'Brien Brothers & Co., manufacturers of paper, Lambertville, N. J., have made an assignment to George W. Holcomb.

Sherman & Cutright, publishers of the *Journal*, Plattsmouth, Neb., have been closed out on foreclosure of chattel mortgage for $550.

H. M. Crider, bookseller and stationer, York, Pa., has had his store closed by the sheriff. Executions to the amounnt of $3,450 have been issued against him.

Suit has begun to foreclose the mortgage on the property of the Crescent Paper Company at Hartford, Ind., as its bonds have become due and neither interest nor principal has been paid. Among the defendants to the suit are the Capital National Bank, Indianapolis; Citizens' Bank, Hartford; R. T. McDonald, Fort Wayne; Herman Berghoff, Fort Wayne.

The University Press, publisher, Cambridge, Mass., which failed recently for $150,000, will resume business. At a final hearing in the insolvency court on May 9, the court gave its approval to the offer of 25 cents on the dollar, which the creditors accepted. This will be paid in cash, although the court allows six months. John Wilson and C. E. Wentworth of the corporation were discharged of all firm and individual debts. John Wilson will be president and Henry A. White treasurer of the reorganized firm.

Reuben Freeman, printer, 45 to 51 Rose street, New York, made an assignment May 8 to Vincent Rosemon, giving preferences for $7,770 to the following named creditors: Vernon Brothers & Co., $5,000; William Knoepke Pamphlet Binding Company, $500; F. A. Ringler & Co., $500; Frank T. Morrill, $500; George H. Morrill & Co., $770; Chas. Craske, $500. The assignee said that Mr. Freeman's assignment was the result of bad business in the past two years, and he found that he could not continue. Mr. Rosemon estimated the liabilities at $30,000, and the actual assets $15,000.

Fires.

The *World* printing office, Bloomington, Ind., has been burned out. Loss, $2,500.

The Pearl Street Book Store and job printing office, Berlin, Wis., has had a fire loss of $1,500. Insured.

Rogers, Pitkins & Hall, printers, Chicago, Ill., have been damaged by fire. Loss, $7,000; insurance, $12,000.

The *Commercial-Tribune* printing office, Port Huron, Mich., was damaged by fire on April 25. The flames were confined to the basement, where the fire originated from a boiler used for heating for stereotyping purposes. The loss is said to amount to several thousand dollars.

Mortgages, Etc.

[In the appended list R. signifies a renewal of a pre-existing mortgage; B. S., bill of sale; T. D., trust deed, and Real, a mortgage on real estate.]

WESTERN STATES.

Mortgagor.	*Amount.*
H. B. Watson, Redlands, Cal.	$171
L. H. Flanders, Cripple Creek, Col. (B. S.)	1,000
G. E. Bishop, Ida Grove, Ia.	2,240
W. E. Irons, Massena, Ia.	196
A. C. Bausman, Minneapolis, Minn.	2,700
M. J. Clark, St. Paul, Minn. (B. S.)	2,000
S. C. Murphy, West Duluth, Minn.	650
T. S. Hunt, Fessenden, N. Dak.	122
H. E. Deardorff, Salt Lake City, Utah (B. S.).	——

SOUTHERN STATES.

Henry T. Thompson, Darlington, S. C. (Real).	2,500

LIENS DISCHARGED.

F. A. Woodmansee, Cincinnati, Ohio (Real)	4,000
H. C. Frentz, Toledo, Ohio (Real)	1,300
Powers & Lohmer, Wausau, Wis.	200

Obituary.

GEORGE FLAGG FAY.

George Flagg Fay, one of the most respected and well-known citizens of Worcester County, Mass., died at his home in Fitchburg, that State, of pneumonia early on Wednesday morning, May 8. He was one of the senior members of the large paper making firm of Crocker, Burbank & Co., a director and trustee in many local institutions, besides being president of the Vermont & Massachusetts Railway Company. For over twenty-five years he was the treasurer of Christ Church (Episcopalian) and was always a liberal supporter of the church.

A man of quiet, unassuming manners, he was ever actively alert for the general welfare and always liberal and thoughtful in doing good.

His deeds of kindness and generosity were countless, but so quietly and secretly performed that the words of Scripture, "Let not thy left hand know what thy right hand doeth," truly expressed his way of doing.

Mr. Fay was born in Warwick, Mass., September 26, 1828, and early went to live in Lowell with his parents, Dennis and Adeline Flagg Fay. In 1845 he went to Sharon, and was associated with his father in the lumber business, staying there till 1849, when they all went to Royalston, Vt., where his father established a store. He went to Fitchburg in 1852.

He married on October 14, 1863, Emily J. Upton, daughter of the late Col. Edwin Upton, of Fitchburg. She died in October, 1866, leaving two daughters, one of whom died in early childhood; the other survives him.

James Kelly, one of the founders of the Chicago *Tribune*, died at the home of his daughter at Winnetka, Ill., on May 5. He was born in New York in 1809, and went to Ireland with his parents when twelve years old, where he was educated. On returning to New York he entered the book publishing business. He went to Chicago in 1838 and started the *Gem of the Prairie*, one of first newspapers in the place. With J. K. C. Forrest and J. E. Wheeler he established the *Tribune* in 1847.

Personals.

Alex. Strich, of Berlin, arrived here yesterday on the Augusta Victoria.

Julius Lewy, of Lewy Brothers, Germany, arrived here last Saturday on the Columbia.

Jacob Salomon, of Salomon Gebruder, Harburg, arrived here yesterday on the Augusta Victoria.

A. Pagenstecker, of the Hudson River Pulp and Paper Company, sailed for Europe last Tuesday on the Havel.

H. G. Fuller, manager for the Rumford Falls Woolen Company, Rumford Falls, Me., has severed his connection with that company.

Henry D. Oliver, who represents the New York agency of W. C. Hamilton & Sons, Philadelphia, Pa., has located at room 162 *World* Building, New York. Mr. Oliver proposes to cater to the demand for finer grades of paper.

Adam Laurie, Hamilton, Ohio, has just returned from the Pacific Coast, after a visit of nine weeks there, during which time he traveled more than 6,000 miles. He reports the trip as having been very enjoyable, through a land of sunshine, flowers and fruit, and he noted great improvements in the cities, towns and country during the eight years which have elapsed since his former visit.

Harry E. Dewey has resigned his position with the Plymouth Paper Company, Holyoke, Mass., with which he has been connected for the last three years, and has been employed by Chas. T. Askew, wholesale dealer in paper and cardboard, 166 William and 41 Beekman streets, New York, to travel through the State of Pennsylvania and the South. Mr. Dewey is well known throughout this territory, and no doubt his many friends will remember him with orders in his new position.

Accidents.

Jacob Goodfellow had his fingers crushed at the Sweet Paper Mill, Phœnix, N. Y., last week.

Arthur Spencer, employed at the Waverly Mills, Buckland, Conn., had his leg broken and was otherwise injured by a bale of stock, which fell upon him while at work on April 30.

Robert Ackles, an employee of the Bangor Pulp and Paper Company, Orono, Me., while oiling machinery in the company's mill on May 2 was caught in the machinery and terribly mangled. He died soon after.

Leopold Patsch, a foreman at the mill of the Wabash Paper Company, Wabash, Ind., was scalded about the face and breast on April 21 by escaping steam from the valve. Several years ago he fell into a vat and was scalded from head to foot.

A few days ago the Sault St. Marie Pulp and Paper Company, Sault St. Marie, Ont., had a serious accident with its first boom of pulp and other woods as it was being towed down Lake Superior by the tug Ruth. The boom got into the stream leading to the rapids and, being cut loose to save the tug, broke to pieces on the rapids. Three tugs were secured to get the logs into the lower bay. They succeeded in catching most of those which passed the rapids, and some days have been spent in securing the remainder which stuck on the rocks. The loss of logs will not be great. The expense of recovering them will involve a large item for tugs and labor.

Small leaks are thought not to amount to much, but an English engineer shows that a hole only 1-16 of an inch in diameter, with a water pressure of only 45 pounds per square inch, will get away with 648 gallons per day; say 20 barrels full in round numbers.

Management of a Paper Mill.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY JAMES HALL.

The success of any business depends upon the management, and a paper mill, with its multifarious interests, is no exception. No matter how conveniently the buildings may be laid out, nor how modern or complete may be its mechanism or the skillfulness of its workpeople, if the business is not properly managed by the man who stands at the head of the concern, and to whom is intrusted the responsibility of conducting operations, that business will sooner or later come to grief and the stockholders will lose their money.

How many battles have been lost, great bodies of men slaughtered and the whole army routed by the unskillful generalship of the one man on whom the responsibility rested! In the same manner many a business which had every chance of success at the start has come to grief through the ignorance or stupidity of those in control. Were the history of the "start" and the "failure" of many joint stock companies written, it would be a useful book of reference for the guidance of those who have the management of large business industries. It would be to the paper maker like the chart to the mariner—it would show all of the rocks and banks on which others had made shipwreck. What a revelation it would unfold! A hundred secondary causes might be assigned for the non-success of the company's business, but these would all be traceable to the want of tact, the lack of energy, the utter incapacity or gross ignorance of the man in charge. Alas! it often happens that before all this is found out stockholders have lost their money or had their finances so crippled as to seriously hamper their future operations.

The history of our civil war abundantly illustrates the point at issue. One general after another was placed in command—men in whom the faith and hope of the nation were centred, but who, by incompetence and incapacity, failed to grapple with the grave responsibilities placed in their hands, and were in due course relegated to the comparative obscurity from which they emerged. Meanwhile, through this lack of ability to grasp the details of the situation, an immense amount of blood and treasure was lost to the nation and the flower of the army was annihilated.

In precisely the same manner is a paper mill business often ruined. A company is formed under the most favorable auspices. Ample funds are subscribed with which to furnish the mill with everything necessary to secure the best results with respect to product and profit. Operations are begun, and the stockholders look forward with faith and hope to the expected dividend. Half year after half year passes over and there is not only no dividend forthcoming, but, on the contrary, the men who have invested their capital as they believed in a profitable business have to face a big loss! Then, and alas! not until "then," do they begin to cast about for the cause of failure, and it is some time before they realize that they have got the wrong man in command, and it is especially so when the man himself is adroit enough to shift the blame on to someone else, or use all of the sophistry which he can command to obscure the vision of his directors as to the real cause of failure. This goes on in many cases for years, until "hope deferred maketh the heart sick," and the business and the capital are both growing "smaller by degrees and beautifully (?) less."

After a time the management is changed, and then comes the "tug of war!" When General Grant succeeded to the control of the grand army of the republic of these United States one of the first, as well as one of the greatest, difficulties which he had to encounter was that of rectifying the blunders of his predecessors, and then to set about retrieving the ground they had lost.

In like manner the man who succeeds to the management of a paper mill which has been allowed to run down has a very tough and up-hill battle before him. Not only does the mechanism need to be thoroughly overhauled, but "lost business" has to be recovered; and to do this requires all of the skill and ingenuity that he can command; Anyone can "pull down," or, more correctly speaking, "let down" a business, but it requires a genius to "build up," and especially so where, in the "letting down" process, the mill has acquired a bad name.

Now all of this may be avoided by doing the right thing at the beginning. Boards of directors are not often composed of the most homogeneous individuals. Men invest money in a stock company and this may be their only qualification for a "seat at the board." As a rule the greater their investment the more the likelihood of their being appointed directors. In this way men are often appointed who have no capacity for business of any kind, much less for that of the one in which they are engaging, but who very frequently make themselves obnoxious or become obstructive to the management. A case of this kind came under the writer's notice. A man with more money than brains was placed on the directorate of a mill. He was a great horseman, and his visits to the mill were not for the purpose of looking into the manufacture of paper or the prospect of a dividend, but simple to inspect the "hosses"; and many a "set back" did this worthy give the superintendent because of something wrong with the horses.

Assuming, however, that a board of directors is composed of intelligent and shrewd "men of business," men of varied experience in commercial pursuits, although possessing no paper making knowledge or ability, they may get along very well if they only secure the right man for manager. Otherwise it would be like the "blind leading the blind"!

The manager should be a man not only of high-class business ability, great energy of character, dogged perseverance, indomitable courage, a great knowledge of human nature and how to deal with it, but should have, in an eminent degree, a great capacity for work, be perfectly reliable and trustworthy in every particular, used to the control of large bodies of help, a good disciplinarian, &c.; but above and beyond all these he should possess a thorough practical knowledge of the paper making business in all of its details. He should be a "paper maker."

With a man like this at the head of a concern, the business is safe while he attends to the purely commercial part of it, and he will then hand over the paper making proper to the superintendent, whose training and experience have made him an expert at his business. The one "gets the orders," the other "executes" them. Where there is mutual confidence in each other's integrity and fitness, these two officers—manager and superintendent—work together harmoniously; but if the superintendent for example is hampered with a manager who "thinks that he knows" but doesn't; and who is continually "meddling and muddling" in the superintendent's domain, there is sure to be trouble. It is like a "house divided against itself." A discreet man will not do this, but will leave the practical working of the mill to the man who was "hired to run the mill" and who is responsible for the paper made.

Such a contingency, however, will not occur where directors delegate the general management to the right man. It is only where a pedantic and obstinate man is put in control—whose knowledge of paper making is like that of the carpenter who learned his business through once living in the same street as a carpenter—that any hitch occurs between the purely commercial and practical part of the business.

A good manager will have a good superintendent, and then things will go right; but a manager like that just referred to never likes a man about him who "knows more than himself"; but will at the earliest opportunity—and if an opportunity does not occur he will make one—get rid of the superintendent; and where a mill is constantly changing its superintendent, that mill is losing money all of the time. This is a truism none can gainsay. Two instance of this kind have come under the cognizance of the writer. In two years and a half each of these mills, both under the same management, have had four superintendents, and neither mill has paid one cent of dividend; but, on the contrary, each has lost a "pailful of money," the result being that stockholders would be glad to realize, and not be very particular about price.

General Notes.

The Kimball-Beasley Company, stationer, San Diego, Cal., has been attached to the amount of $106.

An execution for $1,645 has been issued against the Duquesne Printing and Publishing Company, Pittsburg, Pa.

The band connected with the E. B. Eddy Company, Hull, Ont., has issued a challenge to non-professional bands in Canada to engage in a musical contest for the championship of Canada and a stake of $1,000.

The Flour Sack Manufacturers' Association held a meeting at the Gilsey House on Wednesday, there being present Alfred Adams, J. A. Manning, R. Fred. Doud, J. R. Davis, D. S. Walton, Clarence Howland, B. B. Taggert, S. George, Jr., and James Arkell. There was some fear that the association would go to pieces, but finally it was decided to keep the organization intact and to maintain prices as at present fixed.

The Riverton Paper Company, Riverton, Conn., is in trouble and has asked its creditors for a year's extension. It shows $22,000 assets, made up of mill $20,000, receivables $450 and the rest stock, and liabilities of $13,000, made up of $8,000 mortgage and $5,000 payables.

Catalogue No. 42 of the Jeffrey Manufacturing Company, Columbus, Ohio, is replete with information relating to the company's manufactures, such as rope drives, cable conveyors, elevators, chains, engines, belting, couplings and many other appliances used in mills and elsewhere. Illustrations add to its completeness. In such a large list of labor saving devices consumers will undoubtedly find appliances adapted to their work, or if not, the manufacturer states that they can be so adapted with slight modifications and with equally good results.

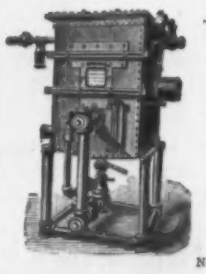
The strike of the color mixers and printers employed in the factories operated by the National Wall Paper Company, which was ordered on Monday morning by the National Wall Paper Machine Printers and Color Mixers' Union, was declared off on Monday night; and the men resumed work at the usual time on Tuesday. The differences of the union and the Wall Paper Company were settled at a conference on Monday afternoon. The operatives demanded employment for eleven months in the year, and a compromise was effected by the terms of which the company will pay half wages while the men are idle. This is regarded as more than the equivalent. The strike, had it held, would have been far reaching in its effects. The grievance began with the printers and color mixers in the factory of Janeway & Co. at New Brunswick, N. J., and thereupon the men went out in response to orders from the union. At the same time the strike was declared in all factories controlled by the trust. When the printers and color mixers stopped work all the factories were obliged to close, as it was impossible to operate them unless the men in those departments worked. The result was that more than 10,000 hands were thrown out of employment. Prior to September, 1894, the printers and color mixers were paid by the year regardless of the number of days they worked. This arrangement was mutually advantageous, because the men often worked fourteen hours a day during the busy season, receiving no extra pay for overtime. With the ending of this arrangement the first trouble of the National Wall Paper Company with its employees began.

Mineral oil, which gets on belts through carelessness, or sometimes unavoidably, is very injurious to the belts. It can be extracted, and while this process does not leave the belt as good as it was originally, it leaves it in much better condition than it would be with the mineral oil in it. The article used in the process of extracting the oil is naphtha. The belt is put in a tank, and the tank made airtight, and afterward through a cock naphtha is introduced into the tank, and the oil is extracted from the belt; after this the belt is dried, and then thoroughly dressed with proper belt dressing and the belt is ready for use again. The cost of this extracting is 5 cents per pound of the weight of the belt.

A very bad habit in mills where there are large driving belts is shifting belts with a square stick, no regular shifters being used. The result of this is the belts are more or less injured on the edges. All heavy machines should have shifters to act so that they shift the belt over steadily, not putting too much strain on the driving belt too suddenly.

In Town.

C. M. Phelps, Holyoke, Mass.; Frank Gilbert, Waterford, N. Y.; T. S. Coolidge, Ticonderoga, N. Y.; Alf. Adams, Chagrin Falls, Ohio; J. A. Manning, Troy, N. Y.; R. Fred Doud and J. R. Davis, Pittsburg, Pa.; Clarence Howland, Akron, Ohio; B. B. Taggert, Watertown, N. Y.; N. Burbank, Boston, Mass.; T. H. Parks, Glens Falls, N. Y.; S. George, Wellsburg, W. Va.; James Arkell, Canajoharie, N. Y.; S. S. Stevens and F. L. Stevens, North Hoosick, N. Y.; F. G. Weeks, Skaneateles, N. Y.; F. P. Waterhouse, Boston, Mass.; J. C. Brocklebank, Chicago, Ill.; W. H. Eaton, Lee, Mass.; Thomas Duncan, Hartford, Conn.



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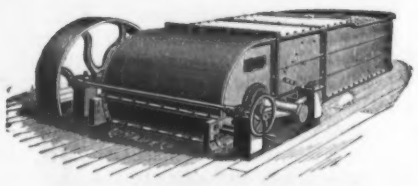

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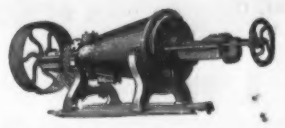

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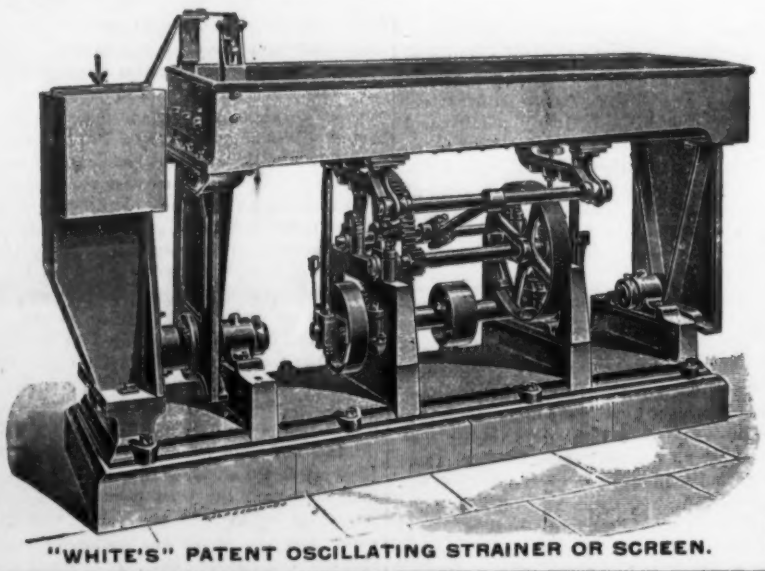

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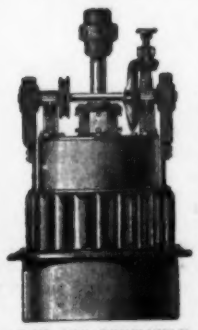

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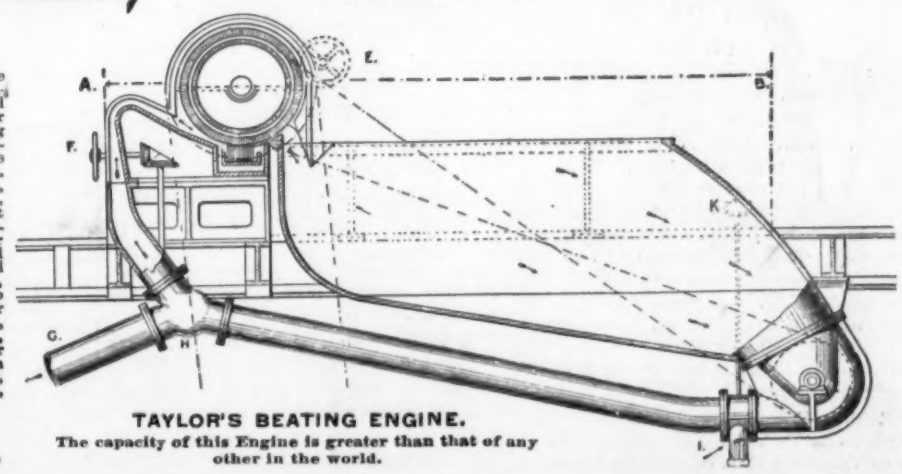

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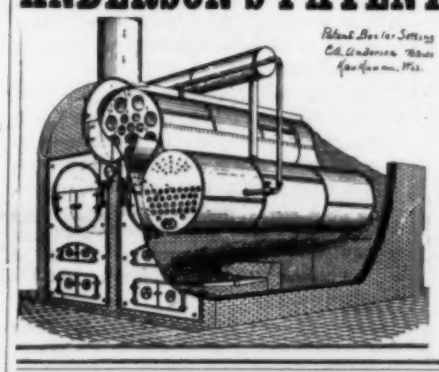

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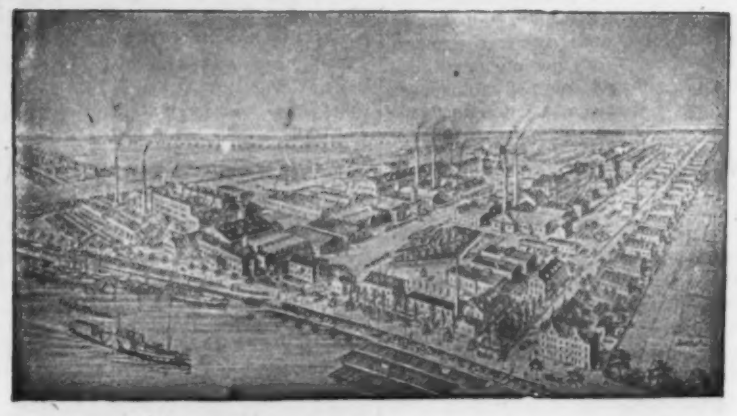

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		The Wanaque River Pulp and Paper Co., Wanaque, N. J.	3
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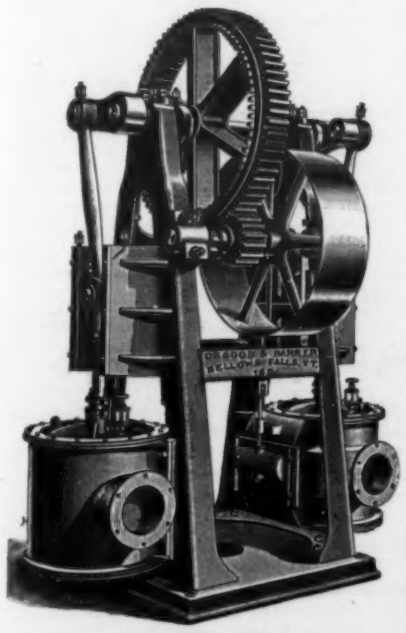

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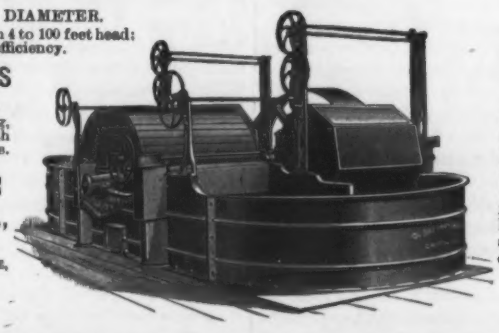

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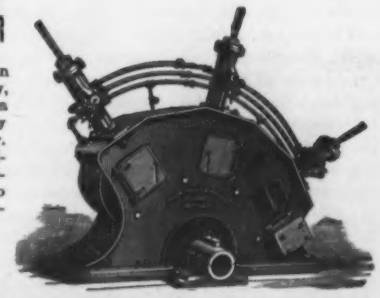

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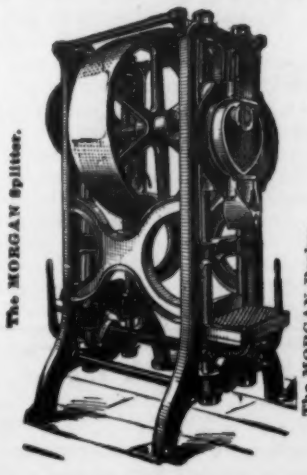

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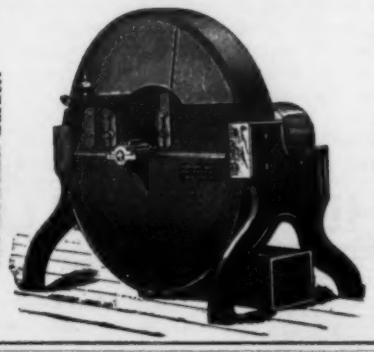

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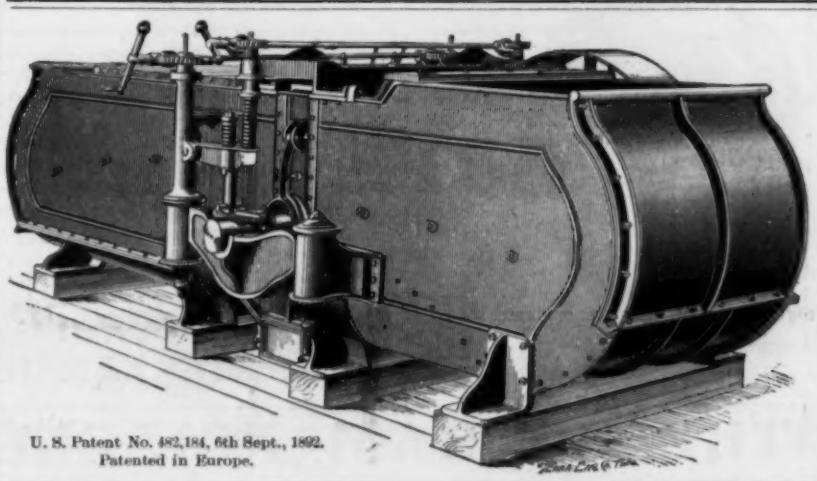

U. S. Patent No. 482,184, 6th Sept., 1892.
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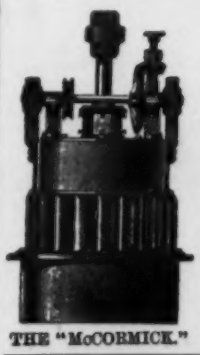

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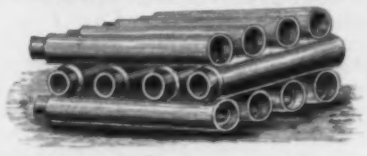

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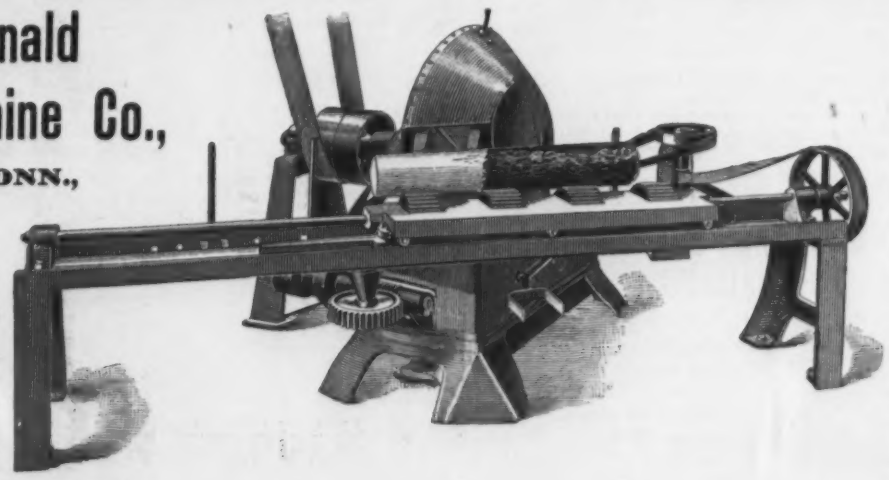

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Peculiarities of Tree Growth.

The forest lover and botanist can always find an abundance of vegetable curiosities that will escape the observation of less interested persons. While each of nature's kingdom has many things to attract and hold the undivided attention of its devotees, the student of botany, whether an amateur or a professional, will yield nothing in behalf of the vegetable kingdom. Especially is this true of him who makes a study of forestry. The forest lover makes friends and companions of trees. He learns their moods, their habits and peculiarities of growth, while they in turn teach him wonderful lessons.

There is a beneficence about a forest which must always have its effect upon dwellers within its influence, where there is companionship in single trees, if familiar to one from day to day.

Even the brute creation acknowledges the former, the highest types being found in timber lands; only the lower ones approaching the reptilian in form being found as permanent denizens of the vast sandy or alkali treeless plains of either hemisphere. It might be claimed that the buffalo, the splendid game quadruped of the Western world, was in history exception to this rule. But the real fact is that he reached his greatest perfection in those prairie sections which were interspersed with natural shelter belts of heavy timber, such as forest lined rivers and creeks, or wooded ridges, that gave ample protection from the fierce sun of summer or the fierce blasts of winter.

Forest peculiarities include a mass of interesting knowledge which is withheld from the general public. For instance, who among the non-professionals can explain why the deciduous growth follows the destruction of conifera? Or why certain species accompany one another? And yet these are common and every-day facts.

The more one studies this subject the more interesting it becomes, and a few illustrations may serve to draw attention to it. There is a tree, habitant of the foothills of the mountain ranges of the Pacific Coast, called the madrona (Arbutus Menziesii, Pursh.), which is always in foliage, although not a conifer. The old leaves roll up into brown balls during the heat of the dry season, after the new ones have nearly matured, after which they separate from the branch with a sharp report, like the cracking of firecrackers, producing a rather startling effect upon the uninitiated traveler.

In addition this tree sheds bark early in the summer, prior to changing its foliage. At the proper time the bark splits from the ground up to the extreme points of the last year's growth on the minutest twigs, whence it rolls up and falls to the ground. At maturity the old bark is of a rich coffee color, and smooth and hard. The new bark presents a beautiful shade of dark pea green when first exposed, which darkens from day to day to maturity.

In the Sierra Nevada Mountains the flowering dogwood grows to the size of a respectable tree. In the eastern part of Amado County, Cal., at an elevation of 37,000 feet, at a bend in a road built to a lumbering camp and saw mill, there stand two such trees, about 16 inches in diameter at the ground and about 30 inches apart. At the height of 10 feet from the ground the trees are joined together by a regular Siamese union. At the points of junction the trees are fully 12 inches in diameter, and the connecting growth is upwards of 5 inches in diameter in the centre, increasing largely toward each trunk. Examination shows that the trees have no connections at the roots, being two separate and distinct trees.

The location was wild and unfrequented, away from any trail, until the road was located, less than five years ago. There is no appearance of two branches having been grafted together artificially, but there is every evidence of its being a simple freak of nature.

Again, certain trees, like certain animals, become extinct in particular localities without any apparent cause. The giant sequoias of California will never be reproduced. They are the survival of a prehistoric age which could alone produce them, being the oldest living specimens of forest growth on the continent—older than large areas of the continent itself.

Certain trees are inimical to others, it being impossible to make them grow side by side, while on the other hand certain species exert a benign influence over others to such an extent as to almost necessitate their planting together, if the best results are desired.

Who can explain why the coniferæ, as a rule (the sequoias being an exception), can be propagated only by seeds, while a large majority of deciduous trees renew themselves from sprouts, from old roots or can be propagated from slips?

Men clearing a black-ash swamp in Northern Michigan discovered a white pine stump of great size, inside of which was a hemlock stump, also very large, and inside of the hemlock two yellow cedars of good size, joined at the roots. The stump puller took the whole mass out together, when an examination showed that the shell of the white pine was yet about 16 inches thick and sound, while the hemlock had a shell of over a foot in thickness, hard and sound, the cedars being sound with the exception of a small heart and each about one foot in diameter.

Computing the age of each from the number of rings in the shells, the pine must have been at least 1,500 years old when it ceased growing; the hemlock was fully 600 years old, and the cedars 140 years old.

A reasonable allowance for an interim between the death of the pine and the seeding of the hemlock, and the death of the latter and the seeding of the cedar, makes it appear that the pine must have sprung from a seed more than 3,000 years ago.

This clashes with the theories of the geologists as to the formation of that part of the State, which raises a question between them and the believers in the "ring" theory of annual growth.—*Hardwood.*

Management of Steam Engines.

It is rather a difficult matter to write about the management and repairing of engines, as nearly all the repairs are what should be a machinist's job; and as almost all would require machine work to properly complete it, it cannot be classed as part of an engineer's business.

As regards the management of steam engines, it will be necessary to begin at the foundation and give a minute description of the manner of setting up and adjusting work, which every engineer should understand, in order that he may know what his engine needs when not doing its work properly. Every foundation for an engine requires the skill of a stone or brick mason to build, and, when that is properly done, then the engineer's duties begin, the first thing being to place the frame or engine bed upon the foundation, seeing that it is banded up and firmly held in its proper position.

The next thing in order is to place the shaft in its bearings, seeing that it is on a proper level and fits its bearings properly, to run easy and smooth. Then place the fly-wheel in position upon the shaft, taking care that it runs true (as it should be properly fitted when made), placing it at an equal distance between the shaft bearings, so that the weight will be alike on each. Next in order is the placing of the cylinder on the bed in its proper position; there should be no mistake about this, as there should be what are termed steady pins to hold it in its place.

To prove that the shaft and cylinder are properly placed attach to the outer end of the cylinder a small piece of board, long enough to reach across its end, and fastened with one of the bolts which hold the head on. Attach to this piece a fine, strong cord or wire that will not break on being drawn tight; fasten on the farther end of the bed another piece of board, leaving enough to stand up as high as the centre of cylinder; attach the other end of the cord to the latter piece, bringing it exactly to the centre of cylinder, which can be done with calipers.

Turn the fly-wheel over, bring the wrist pin to the line, and be particular that it is exactly in the centre of the bearing of the pin; then reverse the fly-wheel and bring it to the line on the other centre. If the line is on the centre of cylinder, also on centre of wrist pin, when turned on both centres, then your engine is in line; but if not, then the cylinder must be out of line, or else the shaft is not square with the cylinder, in which case it must be brought to a perfect line either by moving the cylinder, or pillow block, to the outer end of the shaft. When these points are in a perfect line, put in the piston and attach the connecting rod to the cross-head, being sure that the cross-head comes in a perfect line with the centre of cylinder.

When this is accomplished, all is ready for connecting the smaller parts, such as cut-off, rod valve, &c. This brings us to an important part of the work, viz., the setting of the valve, of whatever kind it may be. We find this the most simple way to adjust a slide valve engine: turn the fly-wheel to its farthest point, or, in other words, to its centre point, which will bring the piston head to one end of cylinder; now set the valve so as to cover the port, leaving not more than 1-44 of an inch from the introduction of steam, when the crank is on its centre, and see that the valve stands in the same position; if not, it may be adjusted by the length of connecting cut-off rod until the valve stands in the same position at each central point. When this is done, see that the exhaust port is clear to relieve the cylinder of the steam at the proper time. We have seen engines set up with the valve of a length not to admit of a free exhaust, which has caused the engine to work heavy.

Other important points in the arrangement of an engine are the steam feed and exhaust pipes. The rule generally adopted is to have the exhaust pipe one-half inch larger than the feed pipe, but we have found by experience that the exhaust should be 1 inch larger, which will cause the machine to run much freer, causing less strain than when a smaller pipe is used. Yet another important point is the setting of the piston packing rings; these should be set very carefully, taking great care that the piston head is exactly in the centre of the cylinder, using a pair of calipers in adjusting it.

As regards care and management of an engine, after being put in order according to the above named points, but little work is required, but it must be constantly watched and kept well lubricated in all its parts, the cylinder receiving special care. It should have a lubricator attached to the feed pipe just before it enters the cylinder, emitting two or three drops per minute, according to the load the machine is carrying, and great care must be taken with the packing rings to keep them just tight enough to prevent any leakage of steam, and not tight enough to cause any great friction.

We have found that a good qualification in an engineer is to know enough to let his machine alone when it is working well and to know when it is doing well. We have known men in charge of machines to be constantly at work at them and often getting them out of order instead of benefiting them. Great care should be taken to keep all the bearings just tight enough to run easy without any slack motion, which causes them to thump or pound at every revolution. In setting up the keys we generally find it best to use a soft metal hammer, which will not bruise the end of the key. In using, hit it one blow on the point, which will give it a little back motion, just to give the bearings a free working motion.

It is the custom of many engineers to oil the cylinder three or four times per day with about one gill of oil, but this is not the proper way. A cylinder needs oil the same as any other bearing, in very small quantities and often. Another important matter is in starting the machine. All drips should be opened and the water drained out by letting a little steam in to warm up the cylinder before it is started, and then slow for one minute, giving it time to work off all water which has settled in it, and getting it well warmed up before running at full speed.

The great point in management is to keep close watch and to know when the machine is not running right; then, if wrong, learn just what the trouble is before any changes are made, as the machine may be injured by not doing the right thing. An engineer should be a good machinist as well as a careful man, possessing good judgment, never doing repairs or making changes until he knows what is necessary to be done. If the above rules are strictly observed, very little repairs will be needed, except in case of breaks, and as to directions about repairs, no mechanic can tell just what to do until he sees just what the break is and determines its cause. Any other plan for repairs would be much like "ideal farming"; practical knowledge is the best.—*Machinery.*

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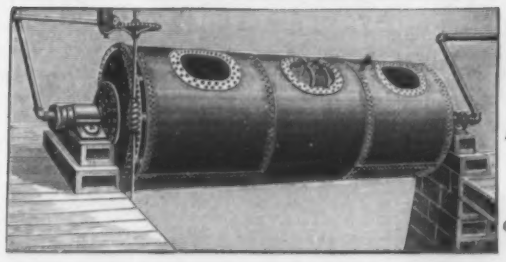

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Apparatus for Producing and Liquefying Acetylene Gas.

Acetylene gas when produced by the decomposition of the carbides of the alkali and alkaline earth metals with water has reduced the cost of its production to such an extent as to render it commercially applicable to illuminating and other purposes. When an alkali metal carbide is used the following formula will explain the chemical reaction: $Ka_2C_2+H_2O=Ka_2O+C_2H_2$, and in the case of alkaline earth metal carbides, $CaC_2+H_2O=CaO+C_2H_2$. In the former case potassium carbide decomposes one molecule of water, forming potassium oxide and acetylene; in the latter calcium carbide and one molecule of water form calcium oxide and acetylene gas. It an excess of water is present the hydrates of the oxides of the various metals are formed. The liquefaction of acetylene gas may be induced at ordinary temperatures by the pressure exerted with this gas generated by the decomposition of the above named carbides by bringing them in contact with water, or its vapor, or with compounds containing an easily separated water molecule, such as hydrates.

If calcium carbide is used for the generation of the acetylene gas under pressure with condensing water at a temperature of 56° Fahr. the liquefaction of the gas takes place at about 485 pounds gauge pressure. With condensing water at an average temperature of 68° Fahr. 610 pounds pressure are required for its liquefaction.

To insure ready liquefaction and a pure liquefied gas necessitates the separation of air, non-condensible gases and water from the acetylene gas prior to or during its liquefaction, all of which can be accomplished with the apparatus described under. It is also advantageous to render the liberation of the gas regular and continuous and to provide proper means for drawing off the liquefied gas into suitable receivers for transportation.

By bringing a properly regulated and continuous stream of water in contact with the carbide, the acetylene is generated and passes from the generator in a continuous current, although it can also be generated in intermittent quantities.

As a solid, in the form of carbide, waste water power throughout the world can be utilized for its manufacture, and it can be shipped long distances without material deterioration. As a gas it can be generated from carbide and applied as such; and in the form of a liquid it can be applied to all purposes of isolated lighting, such as railroad and street cars, carriages, bicycles, steamships, sailing vessels, street lighting, house lighting (in both city and country), buoys, lighthouses, lanterns, and to the enriching of ordinary illuminating gas in dwellings. Its application to this latter purpose will permit the gas companies to produce low priced gas for heating purposes, which can then readily be enriched in each house with acetylene gas generated from a tank of the liquefied gas.

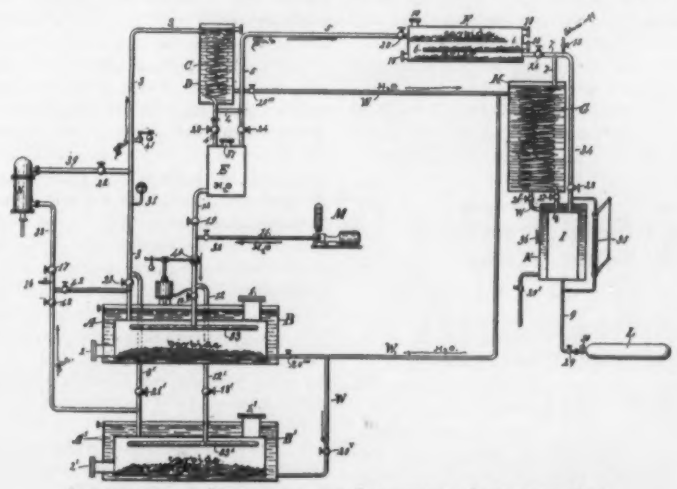
Extended experiments have shown that one electrical horse power will readily produce 20 pounds of calcium carbide each twenty-four hours, and the present indications justify the assumption that with automatically fed furnaces, properly insulated to retain the heat, and by utilizing the waste heat to increase the temperature of the material acted upon, the production of calcium carbide can be increased on a large scale to 30 pounds per electrical horse power each twenty-four hours.

By using limestone and coal dust, the latter being practically a waste product (not at present utilized), it is believed that calcium carbide can eventually be produced at a cost of less than $5 per ton. Where bituminous coal is employed, the value of the by-products obtained by its conversion into coke will largely reduce the cost of manufacture.

The hydrate of lime obtained from the decomposition of the carbide with water can be used again in the manufacture of the carbide, or it can be employed in the manufacture of ready-mixed mortar.

The drawing represents a diagrammatic representation of an apparatus designed for the manufacture of this gas, the cut being partly in section, showing the general connection of the parts with each other.

A and A′ are wrought iron generators provided with filling openings 1 and 1′ and cleaning out openings 2 and 2′. The heat set free by the decomposition of the carbide and water is in great part taken up by the cooling water circulated around the generators A and A′ in tanks B and B′.



Apparatus for Producing and Liquefying Acetylene Gas.

3 is a gas pipe leading the generated gas and intermingled aqueous vapor to the cooling coil C surrounded by water in tank D. The aqueous vapor condensed in the coil passes as water through the pipe 4′ into the water tank E, and the gas leaving the cooling coil is conducted through pipes 4 and 5 to the drying tank F, where the remaining moisture is absorbed by exposing the gas to large surfaces of the carbide contained in this tank on suitably constructed shelves, 6, 6. From the drier the gas passes to the condensing coil G, surrounded by the cooling medium contained in tank H. The gas liquefying in this coil flows to the liquefied gas receptacle I, also surrounded by a cooling medium in tank K, and is thence drawn through pipe 9 to the transporting tank L.

In carrying out the process the following operations are followed: A known weight of calcium carbide is introduced through the filling openings 1 and 1′ into the generators A and A′, and is spread over the lower surface of the generators by inserting a rake through the cleaning out openings 2 and 2′. The filling and cleaning out openings are then closed and bolted tight. Into the dryer F calcium carbide is introduced through the openings 10, 10, 10, 10 and spread to a uniform depth on the shelves 6, 6, and on the bottom surface of the dryer. The openings are then securely closed.

By opening the valves 20′, 20″, 20‴, 20ᵛ, on water pipes W W W, cold water is circulated around those portions of the apparatus requiring a cooling medium. With the exception of the blow-off valves 15 and 16, gas exhausting valve 17, by-pass valves 42 and 43, valve 21′, and valves 18 and 18′ on water pipes, all valves attached to the apparatus are opened, the transporting tank L being disconnected. The water pump M is now started and water is forced through the pipes 11 and 12, and valve 19, into the water tank E, until a quantity sufficient to decompose the carbide in the generator A has been introduced. For every 1,000 pounds of calcium carbide in the generator about 563 pounds of water are required. The water pump M is then stopped, the valve 32 on pipe 11 is closed, the valve 18 on pipe 12 is gradually opened, and a small quantity of water is allowed to enter the generator A through the pipe 33, which being provided with numerous small openings sprays the water on the carbide. The acetylene gas thus generated passes through the entire apparatus, forcing the air which it displaces out of pipe 9, attached to the bottom of the liquefied gas receptacle I.

As soon as the apparatus is freed from air, the valve 29 on pipe 9 is closed, and the valve 18 is adjusted, so that a small and uniform quantity of water is sprayed on the carbide in the generator A, whereupon the pressure immediately increases in the apparatus, which is indicated by the pressure gauge 31. With condensing water at a temperature of 56° Fahrenheit the pressure gradually increases until 485 pounds are obtained, when liquefaction of gas begins. The water pressure regulating the valve 40 is now adjusted to maintain the gas liquefying pressure uniform, by regulating the quantity of water admitted to the generator, the valve 18 remaining open during this adjustment. The disengaged gas passes from the generator A through the gas pipe 3 to the cooling coil C. Here a large portion of the aqueous vapor contained in the gas is condensed, and following the course of the coil is discharged into the water tank E. The gas, however, passes through pipes 4 and 5 into the dryer F, and circulates slowly in contact with the carbide contained therein, which abstracts any remaining aqueous vapor from the gas, generating at the same time acetylene gas, which intermingles with the gas contained in the drier. The united gases are conducted from the drier through pipe 7 to the condensing coil G, where liquefaction of the gas takes place; the liquefied gas flowing into the liquefied gas receptacle I, through pipe 8. The gas displaced in this receptacle by the liquefied gas entering, escapes through the equalizing pipe 34 and intermingles with the gas entering the condenser. The quantity of liquefied gas produced is ascertained by means of the glass gauge 35.

The size of the liquefied gas receptacle having been determined and the temperature of the liquefied gas having been observed by means of thermometer 36, which indicates the temperature of cooling water, it is easy to determine by means of the specific gravity of liquefied gas at the observed temperature the amount of liquefied gas introduced into transporting tank L. The latter is filled by connecting the tank to the flange on the end of pipe 9, then opening valve 30 on transporting tank and valve 29 on liquid pipe. When a sufficient quantity has entered, which is determined by observing the glass gauge 35, the valve 30 on the transporting tank is closed, then the valve 29 on the liquid pipe, and the tank is ready to be disconnected. Any air or non-condensable gas accumulating above the condenser is allowed to escape to the atmosphere by opening the blow-off valve 15.

The valves 27 and 28 on the pipes 8 and 34 are closed in case it is desirable to disconnect the liquefied gas receptacle I while filling the transporting tank.

The valves 19, 23, 24, on the pipes 12, 4′ and 5, are closed in case it is desirable to charge the water tank E with water independently of the pump M. In this case the flange on the opening in the upper head of

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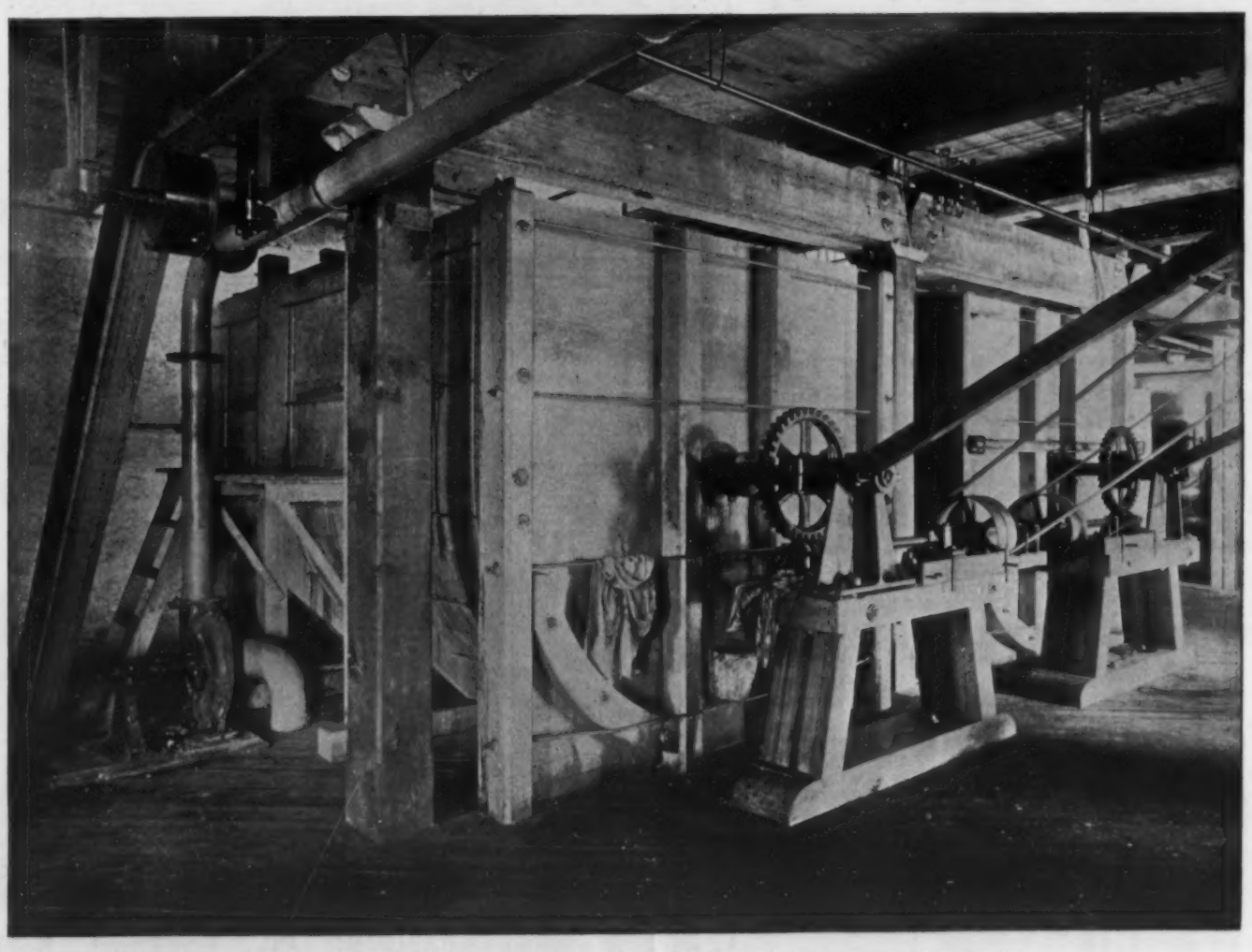

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the tank can be removed and water introduced through the opening 37.

When the decomposition of the carbide contained in the generator A is complete, the valves 21 and 18 are closed, valves 42 and 17 are opened and the gases conducted through the suction pipe 38 to a gas compression pump, N, which forces the gas into the drying and liquefying portion of the apparatus through the discharge pipe 39 and valve 22. The gas in the generator A having been exhausted, the valves 17 and 42 are closed and the flange is removed from the cleaning out opening 2, the refuse caustic lime drawn out of the generator and a new charge of carbide introduced through the filling opening 1. Both openings are then closed, the valve 42 and blow-off valve 16 are opened, and a small quantity of water is sprayed upon the carbide by opening the valve 18. When sufficient gas has been generated to expel the air through the blow-off valve 16, the valves 18, 16 and 42 are closed and the generator is ready to be connected with the remainder of the apparatus by opening the valve 21.

In order to render the operation of the apparatus practically continuous, two generators are employed, and while the gas is being produced in the generator A and conducted to the drying and liquefying portion of the apparatus, water is introduced into the generator A' in sufficient quantity through the spray pipe 33', by opening the valve 18' on the pipe 12', to generate the gas required to expel the air, the valve 21' on the pipe 3' remaining closed during this operation, the valves 43 and 16 being open. After the expulsion of the air the valves 43 and 16 are closed and the valve 21' is ready to be opened, as soon as the carbide in the generator A is exhausted.

Prior to connecting a freshly charged generator, the water pump M is set in motion and the water tank E is refilled with the requisite quantity of water. The water regulating the valve 40 adjusts the delivery of water to both generators.

In exhausting the generators A' of gas before recharging, the valves 43 and 17 are opened, valves 16, 42, 21' and 18' being closed.

If desirable, instead of intermittently charging the water tank E with water, a known and predetermined quantity can be continuously introduced into the generators by the water pump M through the pipes 11, 12, 33 and pipes 12' and 33'.

As soon as the carbide in the drier F is sufficiently decomposed it can be used in the generators and a fresh charge placed in the drier. This is accomplished by closing the valves 25 and 26 and stopping the operation of the generators.

The air entering the drier, while being charged and subsequently displaced by gas when the valves 25 and 26 are opened, can be readily discharged from the apparatus by opening the blow-off valve 15.

The safety valve 41 is adjusted to prevent the development of any excessive pressure in the apparatus. If such should occur the excess of gas escapes to the atmosphere.

Arrangements are now being made by the Electro-Gas Company, of New York city, with the Niagara Falls Power Company, to apply 1,000 electrical horse power to the manufacture of calcium carbide, which is shortly to be increased to 5,000 horse power, and it is expected that eventually the entire available power which the company now possesses will be converted into electrical energy for the manufacture of this product. Assuming that only twenty pounds of the carbide are produced per indicated horse power each twenty-four hours, then the amount manufactured during 300 working days would be three tons per horse power per year; and, applying 100,000 horse power to its production, the annual output of such an establishment would be 300,000 tons. From this amount of material 3,300,000,000 cubic feet of acetylene gas should be produced, and as its illuminating power, compared with ordinary illuminating gas of twenty-five candle power, is as ten is to one, it would represent fully 33,000,000,000 cubic feet of this gas—an amount probably equal to the entire annual output of the gas industry of the United States.

Wire Rope and Its Uses.

(Continued.)

While single rope tramways cannot be recommended for general transportation purposes there are many places where they will give the best possible satisfaction. As already stated they are best adapted to short lines, while the two rope systems only are used for passenger and long distance service. There are, however, many cases in which modifications of these and of the two rope systems are resorted to in order to meet special conditions and requirements.

When ore or similar material is to be transported down a steep incline it has been customary under certain circumstances to erect what is known as a gravity plane. In this system two parallel tracks are constructed between the terminal stations, and a car provided for each track. A single rope is used connecting the two cars and running over a sheave at the top of the incline, the speed of descent being controlled by a brake, the rope being of sufficient length to allow of one car being at the bottom while the other is at the top. This, it will be seen, is an exceedingly economical method of transportation, but in many cases it is difficult if not impossible of construction. In such cases an aerial incline may be readily constructed by using two carrying cables as a substitute for the two tracks.

A notable example of this system has been in operation for some time at Aalsund, Norway, where it is used for conveying ore from the mines which are located at the summit of a steep cliff to the docks at its base, whence the ore is shipped in boats. The carrying cables are steel ropes 1¼ inch in diameter, having an ultimate strength of 72,000 pounds each. These are properly weighted at the bottom of the cliff. This line has a clear span of 2,250 feet from the mine to the pier. One car travels on each rope, carrying a bucket of 1,200 pounds capacity. The loaded car in descending hauls up the empty car, the same as in the gravity plane. The incline is at an angle of 45°. The traction rope passes around brake sheaves at the top to allow proper control and regulation of the speed, the speed of the cars being about 20 miles per hour. The usual amount of ore thus transported by this incline is 100 tons per day, and the engineers report the service to be satisfactory and the expense very slight.

With such an incline, if the load is an ascending one, the power is applied by means of an engine or electric motor situated generally at the upper terminal. In some cases, however, the engine is at the foot of the incline. An example of this method is the incline now in operation for conveying stores from the town of Gibraltar to the fortifications at the summit of the rock. This line has a somewhat smaller capacity than the one just mentioned. The line is 2,200 feet long, with a vertical rise of 1,200 feet. The two cars are designed to carry a maximum load of of 1,000 pounds, and are driven at a speed of 5 miles an hour. In this case the traction rope is endless. There are six intermediate supports, the longest span stretching from the top of the bluff to the town, being 1,150 feet in the clear. Another similar line is located at Nuevo Leon, Mexico, and is used for the transportation of ore.

Wire rope tramways of special design are now in use in rolling mills to convey hot billets and ingots from the rolls or the hot shears to their place of storage. Platform hangers are attached permanently to the traction rope and are loaded automatically without stopping the carriages. They are also self-dumping, making the operation of handling and conveying very speedy and economical. Tramways of this kind have been built of sufficient size to carry slabs weighing 5,000 pounds at a speed of about 150 feet per minute.—*Industrial Record.*

(To be continued.)

Natural Soda Deposits of the United States.*

By Dr. Thos. M. Chatard.

(Continued.)

About two miles northeast from Ragtown one may notice a slight elevation on the surface of the desert, but the ascent is so gentle that one can hardly appreciate it. Suddenly, and without preparation, one comes upon the brink of a precipitous depression in the desert, more than 300 acres in area, the rim being more than 150 feet above the surface of the lake, which covers the greater part of the bottom of the cavity. The shores of this lake are lined with the vats of the soda makers, whose white houses make a pretty contrast with the green salt grass and the blue waters of the lake. Flocks of small birds are continually hovering over the lake, and the whole presents a scene of life and color, the more beautiful because unexpected and in sudden contrast to the burning sand without, where beauty is represented by the horned toad and life by the tarantula.

An eighth of a mile away, and separated by a narrow ridge, is another depression similar to the first, and called the Little Lake. While less attractive, it is quite as interesting; perhaps even more so.

Both of these depressions are evidently the craters of extinct volcanoes. The walls are composed of loose, sandy materials intermixed with pieces of rock, often 2 or 3 feet in diameter, and which are evidently volcanic ashes, with larger masses of scoria. The deepest place in the lake is 312 feet below the highest part of the rim, and as the surface of the water lies many feet below the bed of the neighboring Carson River, it is evident that these lakes, which have no apparent feeders and no outlets, are supplied by seepage from the river.

The water of the Big Lake is a strong solution of salts, mainly common salt, but with a large proportion of sulphate and of the two carbonates. You will remember that I have already told you that natural soda is composed of sodium monocarbonate and bicarbonate, with varying proportions of other salts, mainly chlorides and sulphates. Now I wish to impress upon you that, in nature, these two carbonates are always found together, and, furthermore, that if one exposes the solution of pure monocarbonate to the action of the air the solution absorbs carbonic acid and a portion of the monocarbonate is converted into bicarbonate. The presence of the carbonate in this water must be accounted for by the decomposition of the volcanic ash through the action of air and moisture, as already described, the soluble salts thus formed being leached out of the mass by the river seepage, conveyed to the crater, and then concentrated by evaporation. The change of the monocarbonate into bicarbonate is continually going on, but appears to pause whenever the relation between the two salts reaches a certain limit, and the phenomenon is most important, as it gives us the only means of extracting the valuable carbonates from the accompanying useless salts.

For many years past the extraction of sodium carbonate from the waters of the Big Lake has been an established industry. The method is ingenious, and although, because of natural disadvantages, the annual production is small, the work done here has yielded much valuable practical information, which is now being utilized on a larger scale at Owens Lake in California. As this latter place must be described later, we will not linger at the Big Lake, but pass to its companion, where we shall see an operation which is singular of its kind.

The Little Lake, which gave its name to the smaller crater, has been completely altered in appearance. There are four large, irregular shaped excavations, besides a shallow pool of fresh water from small springs which issue from the sides of the crater. Two of these excavations are situated upon the ledge, which is a natural deposit of crystal soda, of unknown but considerable extent and thickness. These lye pits are filled from the pool with water, which gradually becomes saturated with the soda dissolved from the ledge. The liquid from the lye pits is drawn off from time to time into the crystallizers, as the other excavations are called. By the end of the summer the crystallizers are filled with a saturated solution of soda, which, during the winter, crystallizes out as the ordinary crystal soda. When no more crystals appear to form, by which time the deposit is 10 or 12 inches thick, the crop is gathered, and carefully stacked, preparatory to the drying process, which is the most delicate part of the work. Soda crystal contains 63 per cent. of water and parts with most of it with great ease and rapidity, so that if heated to 90° Fahr., a temperature much below the ordinary summer heat of the region, it melts in its own water of crystallization and becomes a liquid. In drying the crop great care must therefore be exercised, lest the material becomes liquid and much of it thereby lost.

The crop is therefore kept in the stacks until the approach of warm weather, when it is broken up and spread in a layer 2 or 3 inches deep on drying floors, which are covered with light sheds open at the sides. The material is turned over from time to time. When the drying is completed the product is a thoroughly effloresced, white powder; the annual product is about 300 tons.

Returning to Wadsworth, we can then strike in a northwesterly direction through the region known as the Black Rock Desert, which in summer is a succession of alkali flats containing much soda, and in winter an almost impassable morass. This extends almost up to the border of Oregon, in the southern portion of which State lie Abert and Summer lakes, which, though now inaccessible, must in time become valuable, since in their waters the proportion of sulphate, which is very deleterious to the quality of the soda, and must, therefore, be kept out as much as possible in the extraction process, is smaller than in any other large source of natural soda that is known.

Leaving the Central Pacific Railroad at Reno, Nev., we can go southward by the Virginia and Truckee Railroad, and the Carson and Colorado to Hawthorne, Nev., where we can reach Mono Lake, near Bodie, Mono County, Cal.

This is a large lake, covering 85 square miles, with an average depth of 60 feet, and lies in a region of fine scenery; but as to its future I can only repeat what I have elsewhere said, "that this large body of water, of a composition so favorable to utilization, is for practical purposes inaccessible, and that the high altitude and consequent shortness of the evaporating season would, under any circumstances, render the success of any industry established there very doubtful."

Proceeding southward from Mono Lake, we pass over a highly volcanic country and reach Long Valley, in which the Owens River originates. This valley is full of

*A lecture delivered before the Franklin Institute, February 23, 1894.

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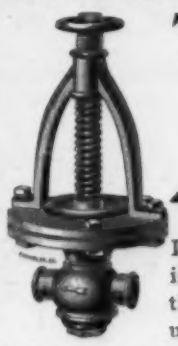

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alkali flats, morasses and pools, the alkali being, as before, derived from the decomposition of the volcanic rocks, a process which is now going on and can everywhere be observed. The drainage of the valley is by the Owens River, a stream which carries a considerable amount of alkali, all of which finally reaches Owens Lake, Inyo County, Cal.

This lake is the most important occurrence of natural soda in the world. Its area is even greater than Mono Lake, being over 100 square miles, with an average depth of not less than 17 feet. It is readily accessible, as the Carson and Colorado Railroad runs along the eastern shore, and can easily be reached by all of the great continental lines.

The lake lies between the Sierra Nevada on the west and the Inyo Range on the east and has no outlet, the lowest point of the rim of the valley being, as I am informed, about 50 feet higher than the present level of the lake. On the western side several small brooks from the Sierra make their way into the lake, but the larger portion of the water supply comes from the Owens River, which empties into the lake at its northern end. This stream was in February, 1892, about 59 feet wide, 5½ feet deep, and had a flow of about 3 miles an hour. These measurements represent a considerable amount of water, but represent probably not more than two-thirds of the daily supply; and one gets some idea of the aridity of the climate, and of the rapidity of evaporation, when one remembers that, although the lake is naturally somewhat higher in the spring than in the autumn, the average depth suffers but little change. Hence at present the evaporation from its surface seems to be about equal to the amount of water received from all sources. As the valley lies between two high ranges of mountains, and is open to the north and south, there is usually a good breeze through the greater part of the twenty-four hours, thus much increasing the evaporation, which may safely be taken as over 5 feet per annum.

The Sierras rise rapidly from the lake, and the peaks are very lofty. Mt. Whitney, which is in plain view, is the highest mountain in the United States. They are well timbered, and their vast, sombre masses form an agreeable contrast to the opposite glaring, light-colored Inyo Range, which is almost destitute of either wood or water.

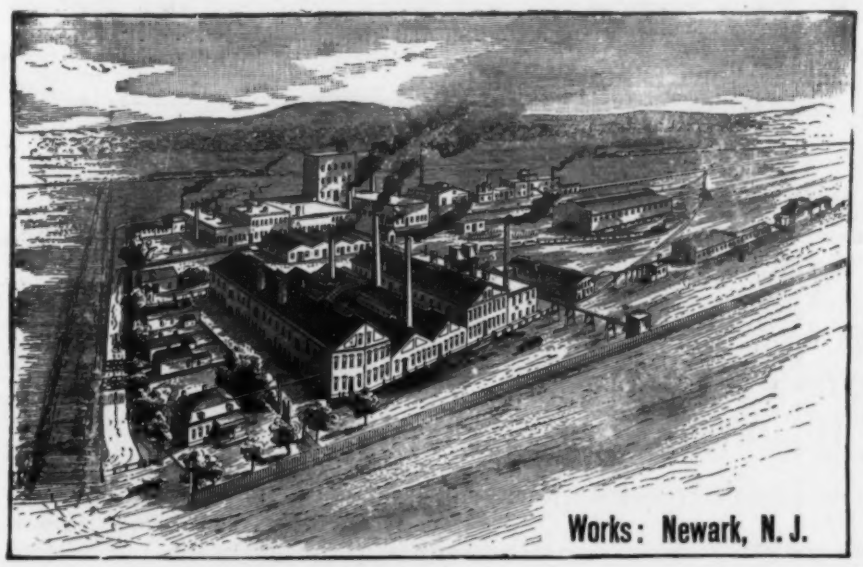
Between the Inyo Range and the lake the valley slopes gently from the foothills to the water edge, affording excellent locations for manufacturing purposes. The shore is covered in most places with a strong growth of salt grass, though there are extensive flats, which are bare.

In the lake itself are large quantities of a sort of "algous or fungoid plant, floating in globular masses of a whitish or yellowish green" (Loew). This collects upon the water in patches, and becomes black with the clouds of alkali flies or ephydra which settle upon it. In addition to the larvæ of these flies the water swarms with the little "alkali shrimp," or artemia. Both of these forms of animal life seem to be inseparable from alkali pools, being found in almost every one of them throughout the world.

The scenery of this valley is very attractive, and the soil wherever irrigated has proved itself to be very fertile. Very little snow falls in winter, and work can be done throughout the year. Even in summer, although the thermometer shows a high degree of heat, this is not oppressive, because of the dryness of the air, and sunstroke is, I believe, unknown. The highest temperature I have ever noted, the thermometer being in an exceptionally well shaded place, was 109° Fahr. Hot as this may seem I spent the entire day at work in the sun with no protection and with no inconvenience, nor did any of the men working around me make any complaint. Indeed, a wilted collar is an impossibility in such a climate, as perspiration evaporates as fast as formed, and it is only necessary to drink a reasonable amount of water, and that not too cold, to have a far more comfortable time that is given to us by our Eastern summers. What is said of Owens Valley is true of the entire western side of the Great Basin, and whatever you may hear of the hardships that travelers undergo, rest assured that those who are acquainted with the region find our Eastern climate much inferior.

At the village of Keeler, the terminus of the Carson and Colorado Railroad, on the eastern side of the lake, are the works of the Inyo Development Company, which has been extracting soda from the lake waters since 1886, and is gradually developing a valuable industry. So far the company has confined its operations to supplying the wants of the borax makers along the line of the railroad, but can at any time speedily expand its operations to produce large amounts of high-grade soda ash.

(To be continued.)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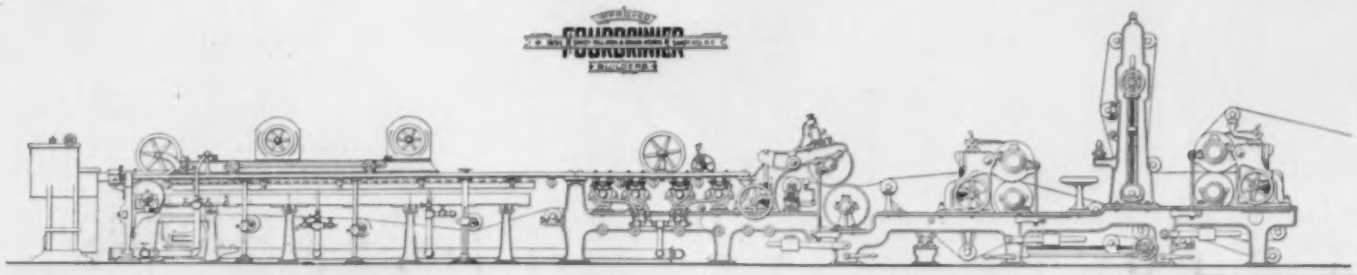
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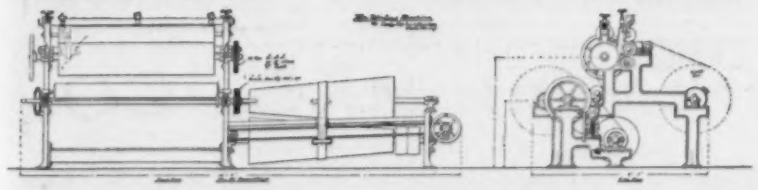
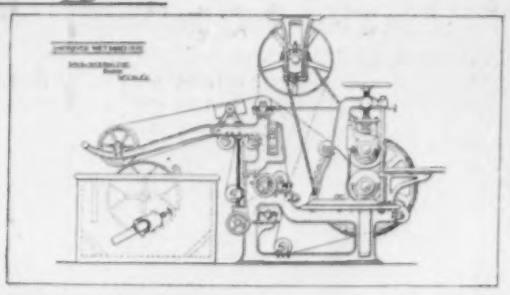

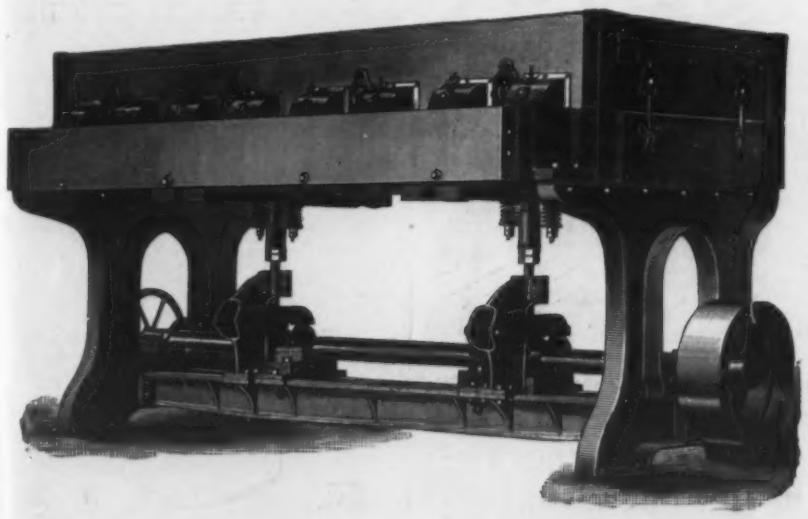
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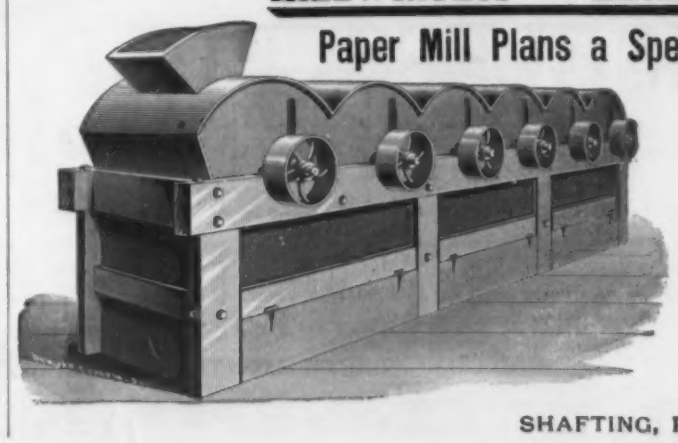

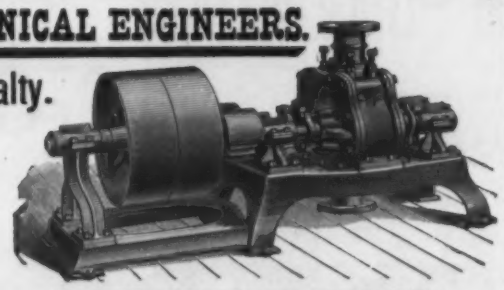

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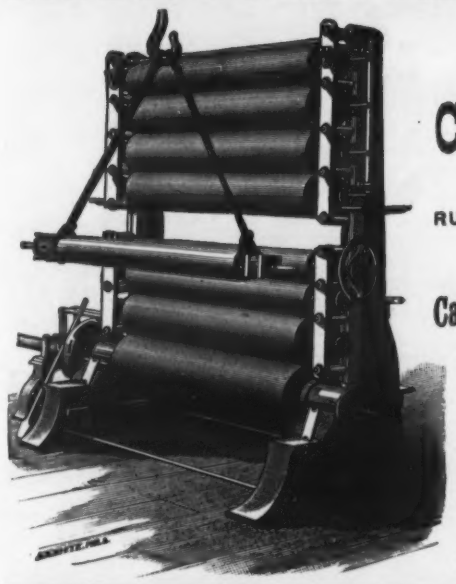

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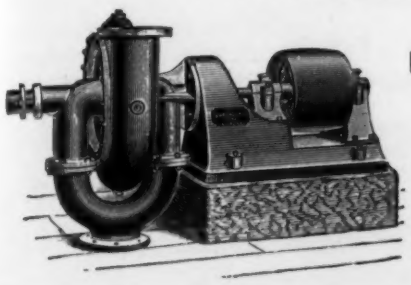

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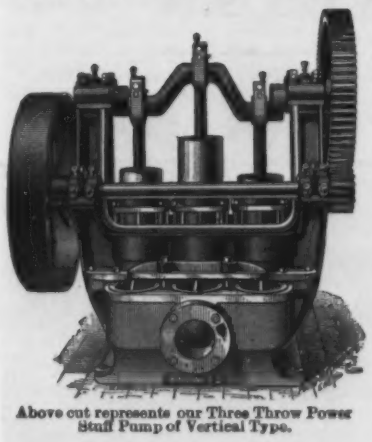

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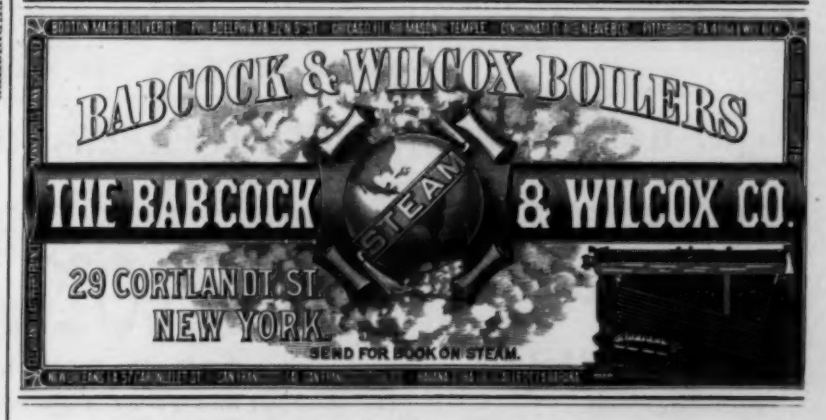

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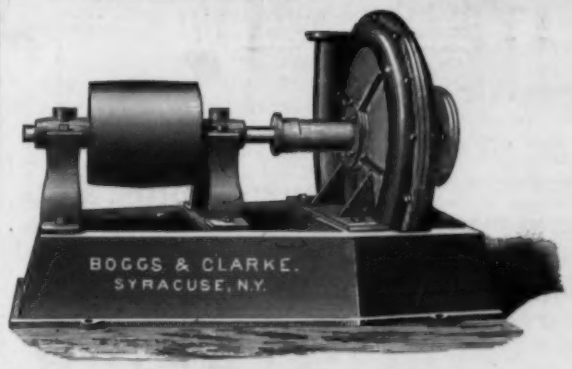

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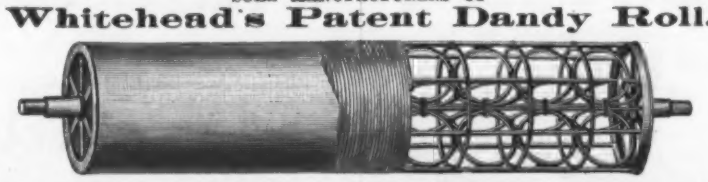

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